iMac (24-inch, M1, 2021, Four ports)

Repair Manual

© 2022 Apple Inc. All rights reserved.

Contents

3 Introduction

Basics

6 Exploded View and Orderable Parts
10 Screws
12 Tools

Safety

15 Broken Glass Safety
16 Electrical Safety

Procedures

17 First Steps
18 Display
40 Battery Board and Batteries
46 Logic Board Cover
51 Stand
61 USB-C Boards
68 VESA Mount Adapter
74 Adapter Board
81 Audio Board
89 Audio Board Flex Cable
92 Battery Board Cable
96 Camera and Embedded DisplayPort Flex Cable
99 Display Backlight Flex Cable
103 Fans
111 High-Speed Flex Cable
115 Logic Board
127 Low-Speed Flex Cable
131 Wi-Fi Antenna
136 Wi-Fi and Bluetooth Antenna
141 Housing

© 2022 Apple Inc. All rights reserved.

Introduction

This manual includes technical instructions for replacing genuine Apple parts in Mac and is intended for individual technicians with the knowledge, experience, and tools required to repair electronic devices.

Important

- Read the entire manual first. If you're not comfortable performing the repairs as instructed in this manual, don't proceed.
- Always use the latest version of this document available at support.apple.com/en_US/manuals/macdesktops.

Warning

Failure to follow the repair instructions or to use genuine Apple parts or proper tools may cause electric shock or other safety issues and lead to personal injury or death.

Caution

Failure to follow the repair instructions or to use genuine Apple parts or proper tools may damage the Mac, parts, or other property, or compromise the device's functionality.

Warranty information

Damage caused by repairs performed outside of Apple or the Apple Authorized Service Provider network is not covered by Apple's warranty or AppleCare plans. Such damage may cause future repairs to be subject to out-of-warranty costs or render the device ineligible for future repairs by Apple or Apple Authorized Service Providers.

© 2022 Apple Inc. All rights reserved.

Tools and parts

Ordering tools and parts

You can learn how to order genuine Apple parts and tools at support.apple.com/self-service-repair. During the purchase process, enter the manual ID **SNCHJB** to indicate that you've read this manual in its entirety and agree that you have the knowledge and experience to perform your intended repair.

Software tools

Apple Diagnostics can check your Mac for hardware issues.

A System Configuration step may be required at the end of your repair. System Configuration is a postrepair software tool that completes the repair for genuine Apple parts. Running System Configuration has a number of purposes that vary based on the part replaced.

What System Configuration does	Why it's important
Updates replacement logic board with device serial number	Replacement logic boards must be updated with your device's serial number to ensure that Apple Pay, FaceTime, iMessage, and iCloud services, such as Find My, can communicate safely and securely with your device.
Transfers factory calibration values	Certain parts like displays, cameras, and ambient light sensors have calibration values that are customized to each individual part during manufacturing. Transferring these values ensures maximum performance and quality after a repair.
Links Secure Enclave and biometric authentication parts	After repair of a logic board or a biometric authentication part (Touch ID), linking the biometric sensors to the Secure Enclave on the logic board is required to ensure device security.
Ensures repair integrity	After a hardware repair, software checks are performed to ensure repair integrity. Repair integrity means that a genuine Apple part has been correctly installed.
Assigns wireless region	To comply with regional communications regulations, a wireless region must be assigned to your logic board.
Updates firmware	Keeping firmware up to date ensures that the device has all the latest security and performance features.

System Configuration requires a strong Wi-Fi network capable of 1.0 Mbps download and upload speeds, with less than 400 ms latency and less than 2% packet loss. Estimated data usage to run System Configuration is 6–22 MB.

The device must be running the latest version of macOS and not a beta version.

Learn how to initiate the System Configuration process at support.apple.com/self-service-repair.

© 2022 Apple Inc. All rights reserved.

Alerts

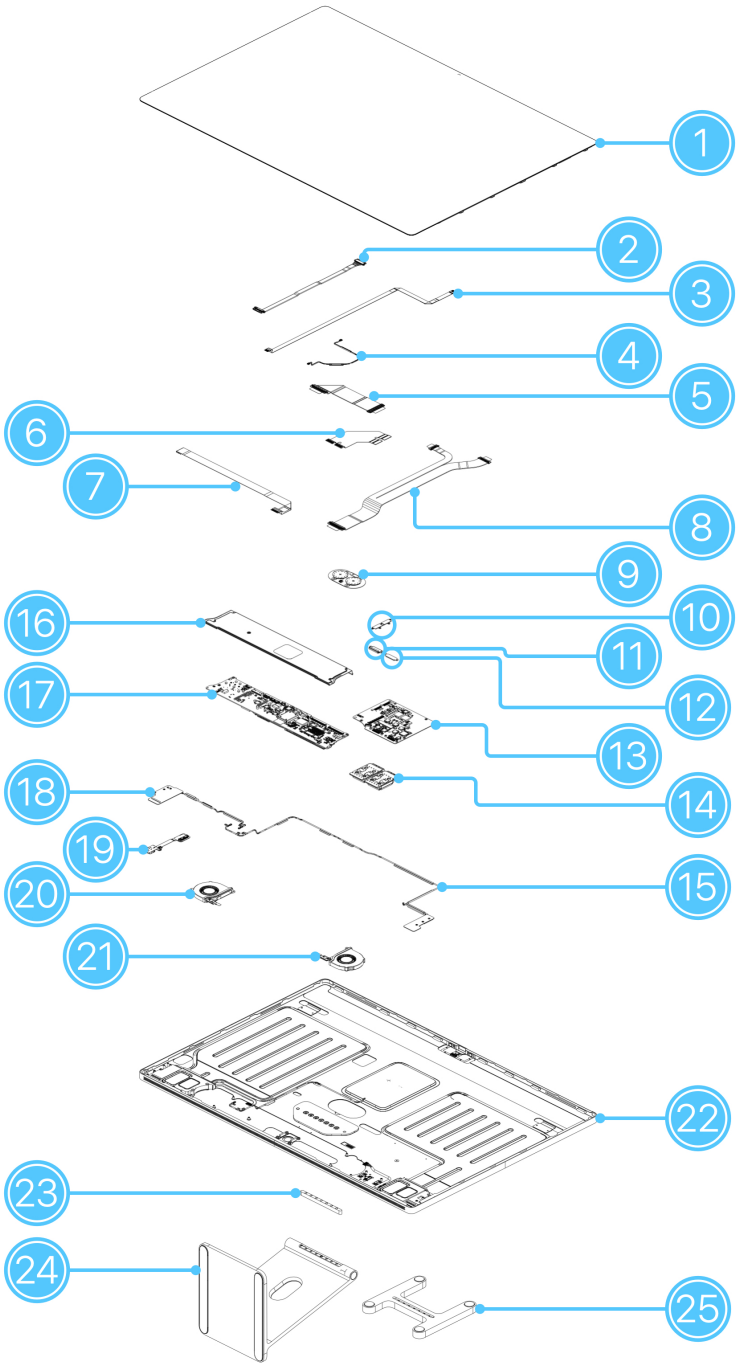
Failure to follow alerts could result in electric shock, injury, data loss, or damage to the device, parts, or other property.

 **Danger**	Instructions for reducing risk of electric shock and electrocution
 **Warning**	Instructions for reducing risk of personal injury
 **Caution**	Instructions for reducing risk of data loss or device hardware damage
Important	Supplemental information for successfully completing procedures; neither a Warning nor a Caution

© 2022 Apple Inc. All rights reserved.

Exploded View and Orderable Parts

This section shows parts, part names, and part numbers for iMac (24-inch, M1, 2021, Four ports).



© 2022 Apple Inc. All rights reserved.

Part Name	Number
1. Display	661-16565, silver 661-16567, yellow 661-16569, green 661-16571, blue 661-16573, pink 661-16575, purple 661-16577, orange
2. Display backlight flex cable	923-05587
3. Microphone flex cable	923-05155
4. Battery board cable	923-05589
5. High-speed flex cable	923-05588
6. Low-speed flex cable	923-05590
7. Audio board flex cable	923-05677
8. Camera and embedded DisplayPort flex cable	923-05586
9. Battery board	923-05182
10. Low-speed flex cable cowling	923-05563
11. Left USB-C board cowling with speaker clip	923-05564
12. Right USB-C board cowling	923-05565
13. Adapter board	923-05163
14. USB-C board	923-05575, silver 923-05576, yellow 923-05577, green 923-05578, blue 923-05579, pink 923-05580, purple 923-05581, orange
15. Wi-Fi antenna	923-05137
16. Logic board cover	923-05133
17. Logic board	661-16543, 8-core CPU, 8-core GPU, 8 GB, 256 GB 661-16545, 8-core CPU, 8-core GPU, 8 GB, 512 GB 661-16547, 8-core CPU, 8-core GPU, 8 GB, 1 TB 661-16549, 8-core CPU, 8-core GPU, 8 GB, 2 TB 661-16551, 8-core CPU, 8-core GPU, 16 GB, 256 GB 661-16553, 8-core CPU, 8-core GPU, 16 GB, 512 GB 661-16555, 8-core CPU, 8-core GPU, 16 GB, 1 TB 661-16556, 8-core CPU, 8-core GPU, 16 GB, 2 TB
18. Wi-Fi and Bluetooth antenna	923-05136

© 2022 Apple Inc. All rights reserved.

Part Name	Number
19. Audio board	923-05138, silver 923-05139, yellow 923-05140, green 923-05673, blue 923-05674, pink 923-05675, purple 923-05676, orange
20–21. Fan (pair)	923-05161
22. Housing	923-05532, silver 923-05533, yellow 923-05534, green 923-05535, blue 923-05536, pink 923-05537, purple 923-05538, orange
23. Flange	923-05175, silver 923-05176, yellow 923-05177, green 923-05178, blue 923-05179, pink 923-05180, purple 923-05181, orange
24. Stand	923-05149, silver 923-05150, yellow 923-05151, green 923-05152, blue 923-05153, pink 923-05159, purple 923-05160, orange
25. VESA mount adapter	923-05188

© 2022 Apple Inc. All rights reserved.

Part Name (Not Shown)	Number
143W power adapter with Ethernet	661-18536, silver 661-18537, yellow 661-18538, green 661-18539, blue 661-18540, pink 661-18541, purple 661-18542, orange
Battery board adhesive	923-05154
Low-speed flex cable to logic board connector cowling	923-05566
Power cord Read the Important alert below to ensure that you order the correct power cord.	923-05141

Important

The English (US) power cord part number begins with 923. Other regional power cord part numbers also begin with 923, but include a regional prefix. For example, the power cord part number for Italy begins with CI923. Identify the correct regional prefix from the list below:

B United Kingdom
CI Italy
D Belgium/Luxembourg, France, Germany, Poland, Spain, Sweden

© 2022 Apple Inc. All rights reserved.

Screws

Caution

- Save undamaged screws and cowlings for reassembly.
- Note the location of screws and cowlings during removal. Then organize them to ensure that you reinstall them in the correct location.
- Both overtightened screws and loose screws can damage parts.

923-05173
Torx® T3
Antenna grounding clip (2)



923-05174
Torx T3
Antenna grounding clip (3)



923-05554
Torx Plus 10IP
Stand (5)
VESA mount adapter (7)



923-05555
Torx T3
USB-C board (4)



923-05556
2.5 mm hex nut
Logic board (4)



923-05557
Torx T3
Logic board cover (11)



923-05558
Torx T3
Fans (2)



923-05559
Torx T3
Adapter board connector cowling, low-speed flex cable (5)



923-05560
Torx T3
Adapter board (5)



923-05561
Torx T3
Logic board connector cowling, low-speed flex cable (3)



923-05562
Torx T3
Cowling, USB-C board (4)



923-05573
2.5 mm hex nut
Logic board (5)



© 2022 Apple Inc. All rights reserved.

923-05574
Torx T3

Bluetooth and
Wi-Fi antenna (3)
Wi-Fi antenna (2)



923-05668
Torx T3

Audio board to antenna (1)



923-05669
Torx T3

Audio board (1)



923-05670
Torx T3

Audio board flex cable (1)



923-05671
3.5 mm hex nut

Audio board (1)



923-06114
Torx Plus 10IP

Stand (2)



—

—

© 2022 Apple Inc. All rights reserved.

Tools

Tools with part numbers are available for purchase from the Self Service Repair Store. Tools without part numbers can be purchased from electronics supply retailers.

923-06028
2.5 mm hex nut driver



923-06029
3.5 mm hex nut driver



818-3269
Adhesive cutter

076-1417
Adhesive cutter replacement wheel



923-06026
Adjustable torque driver (1.2–3.0 Nm)



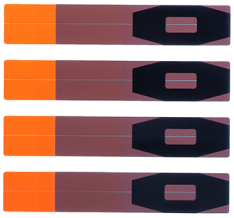
Alignment pins



923-01322
Antenna tool



605-08481
Backlight cable connector tape



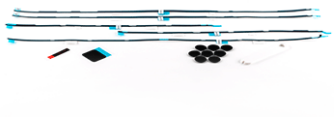
923-01368
Cut-resistant gloves



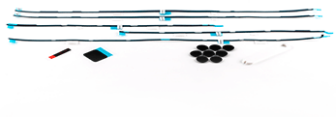
605-11070
Display adhesive strips



076-00499
Display refill kit



076-00498
Display starter kit



© 2022 Apple Inc. All rights reserved.

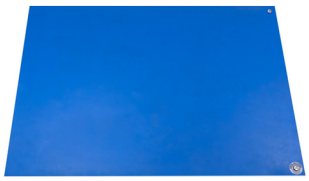
923-0416
Display support stand



EarPods with 3.5 mm headphone plug



ESD mat



ESD-safe tweezers



ESD wrist strap with clip or plug



Ethanol wipes[1]



IPA wipes



922-1731
Kapton tape



605-09054
Logic board cover tape



Magnetizer



Microterry polishing cloth



922-5065
Nylon probe (black stick)



© 2022 Apple Inc. All rights reserved.

Packing tape



Painters tape



Safety glasses with side shields



Silicone roller



922-8262
Sticky sheet pad



076-00507
Support wedge kit



923-06027
Torx Plus 10IP bit



Torx T3 screwdriver



[1] Ethanol wipes must contain at least 90% ethanol and no additives except isopropyl alcohol.

The display starter kit and the display refill kit include the following tools:

- Adhesive cutter
- Adhesive cutter replacement wheels
- Backlight cable connector tape
- Display adhesive strips
- Logic board cover tape

© 2022 Apple Inc. All rights reserved.

Broken Glass Safety

Warning

The display glass will break into pieces if mishandled. If the display breaks and glass gets in your eye, perform the following steps:

- Immediately seek medical attention.
- Don't rub your eye.
- Don't wash your eye. Washing your eye can move the shard of glass and cause more damage.
- Keep your eye closed or loosely patch it to keep it still.

Tools

- Cut-resistant gloves
- Packing tape
- Safety glasses with side shields

Perform the following steps to secure a display with broken glass:

1. Put on safety glasses with side shields and the cut-resistant gloves.

2. If the display is broken and is still attached to the housing, secure the broken glass with packing tape and remove the display.

3. Lay the display on a smooth, clean work surface.

4. Thoroughly cover the broken display with packing tape.



© 2022 Apple Inc. All rights reserved.

Electrical Safety

Danger

The power supply remains powered when the device is plugged in whether or not the device has been turned on. Don't touch the logic board or power supply while the device is plugged into an electrical outlet.

Be aware of the following precautions to avoid electric shock:

- Never remove or install any parts while the device is plugged into an electrical outlet.
- Always wait at least 2 minutes after unplugging the device to allow the logic board or power supply or both to discharge.
- Don't touch the logic board or power supply before the 2-minute discharge wait time has passed.

© 2022 Apple Inc. All rights reserved.

First Steps

Always perform the following steps before starting a repair:

- Back up the Mac.
- If replacing the logic board, turn off Find My Mac. Choose Apple Menu > System Preferences > Apple ID. Select iCloud in the sidebar. Then deselect the Find My Mac checkbox. If you're unable to access the Apple menu, continue performing the following steps.
- Turn off the Mac.
- If you were unable to turn off Find My Mac from the Apple menu, go to iCloud.com/find on a different device. Select All Devices. Select the device you want to remove. Then select Remove from Account.
- Unplug the power cord from both the electrical outlet and the back of the device. Keep the power cord unplugged while the device is being repaired.
- Disconnect all other cables from the device.
- Clear and clean your workspace.
- Put on an ESD wrist strap and attach it to a properly grounded ESD mat.

Caution

ESD (electrostatic discharge, or the release of static electricity) can damage electronic components.

Be aware of the following while performing a repair:

- The manual for this model may show images of other models, but the procedures are the same. Ensure that you use the correct tools for the model you're repairing.
- Take your time. Thoroughly read all instructions and alerts.
- Magnetizing the screwdrivers will make it easier to work with small screws.
- Use only Kapton tape to secure cables and keep them out of the way when removing and reinstalling parts.
- The end of each flex cable must align with its connector. Press the end of each flex cable to its connector until it clicks to ensure that it's secure.

© 2022 Apple Inc. All rights reserved.

Display

Before You Begin

Danger

Read Electrical Safety before you begin.

Warning

Read Broken Display before you begin.

Tools

- Adhesive cutter
- Adhesive cutter replacement wheel
- Display support stand
- Ethanol wipes or isopropyl alcohol (IPA) wipes
- Microterry polishing cloth
- Nylon probe (black stick)
- Painters tape
- Safety glasses
- Sticky silicone roller
- Support wedges



Caution

This procedure requires System Configuration. After you've completed all removal and reassembly steps, learn how to initiate the System Configuration process at support.apple.com/self-service-repair.

Important

This procedure may require replacement tape on the display backlight flex cable connector. Replacement tape is included in the display starter kit and display refill kit. It's not a separate orderable part.

© 2022 Apple Inc. All rights reserved.

Removal

Caution

The display is attached to the housing with display adhesive strips. Each adhesive strip has one foam layer surrounded by two adhesive layers. To remove the display, use the adhesive cutter to cut the adhesive strips. When you cut the adhesive strips, you're cutting mostly through the foam layer. If a wheel is nicked, you must replace it.



Important

Center the stand support wedge and cover the power port before you begin.

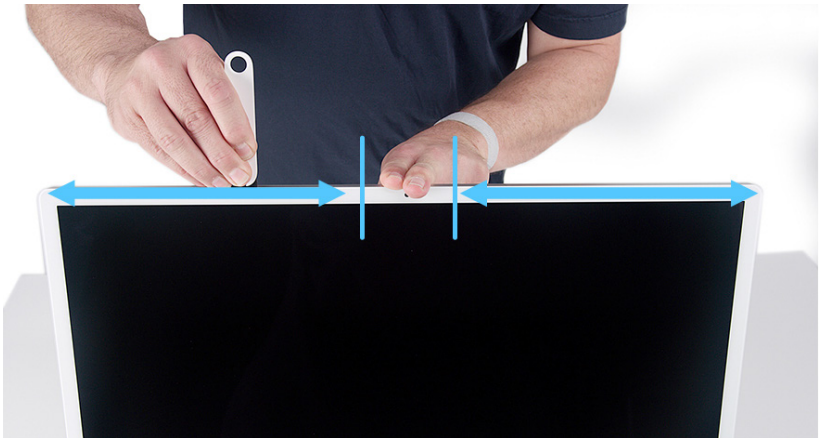
© 2022 Apple Inc. All rights reserved.

1. Place the stand wedge between the stand and housing as shown. Ensure that the wedge is centered and the power port is covered.

 Note: If the computer has a VESA mount adapter, stand the computer upright in the display support stand.



2. Insert the adhesive cutter at a 90-degree angle between the display and the housing. Run the adhesive cutter across the top of the computer, avoiding the 3-inch area surrounding the camera.



Caution

To avoid damaging the camera and display, don't run the adhesive cutter across the camera. Damage to the camera requires a display replacement.

© 2022 Apple Inc. All rights reserved.

3. Lay the computer on a flat surface with the display faceup. Run the adhesive cutter between the display and the housing on the left and right sides.

 Note: If the computer has a VESA mount adapter, lay the computer flat on the VESA support wedge. The VESA support wedge has a square cutout to accommodate the VESA mount adapter. Position the bottom edge of the display closest to the slot in the wedge.



4. Run the adhesive cutter between the display and housing on the bottom edge of the computer.



© 2022 Apple Inc. All rights reserved.

5. Run the adhesive cutter back and forth between the display and housing around all four edges of the computer until the wheel moves with minimal resistance.

Caution

To avoid damaging the camera, don't run the adhesive cutter in the 3-inch area surrounding the camera.



© 2022 Apple Inc. All rights reserved.

6. Insert the flat end of the black stick halfway to its notch between the display and housing. Slide the black stick up and down to cut any remaining adhesive.

 Note:

 • If you feel resistance, pull the black stick out slightly. Then continue to slide it up and down while you vary the insertion depth at points of resistance.

 • If you continue to feel resistance, stop and remove the black stick. Install a new wheel in the adhesive cutter and repeat steps 1 through 5.



Caution

- Don't twist, pry, or insert the black stick past its notch. Forcing the black stick between the display and housing may crack the display.
- To avoid damaging the camera, don't run the adhesive cutter in the 3-inch area surrounding the camera.

© 2022 Apple Inc. All rights reserved.

7. Rotate the computer so the top edge of the display is closest to you. If fully released, the display will extend slightly over the top edge of the housing.

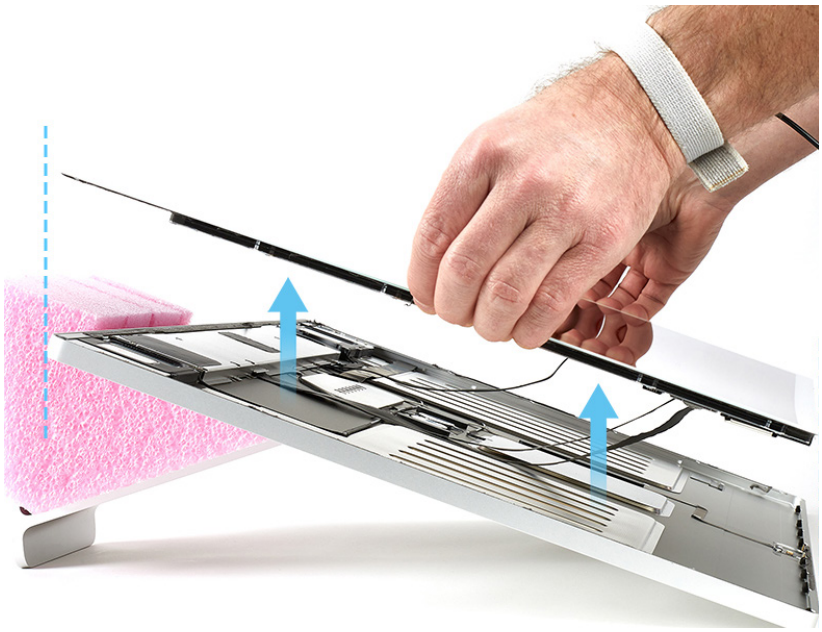
Important

This ensures that the display has disengaged from the display hangers inside the housing.

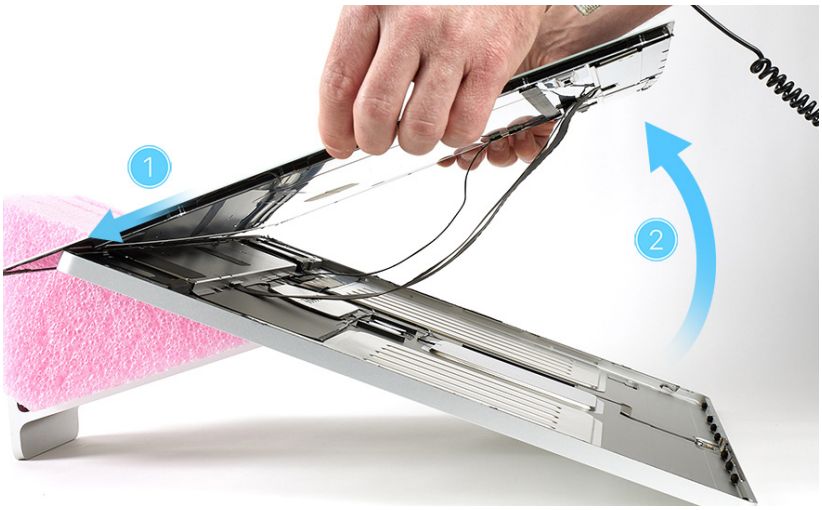
8. Hold the display by the edges and slowly lift it straight up about 1 to 2 inches.

Caution

Don't strain the flex cables that are connected to the logic board and back of the display.



9. Insert the bottom edge of the display into the slot in the stand support wedge (1) as you slowly tilt up the top edge of the display (2).



© 2022 Apple Inc. All rights reserved.

10. Insert the two triangle support wedges into the housing as shown.



Note:

Use the VESA support slot wedge and two triangle support wedges for models configured with a VESA mount adapter.



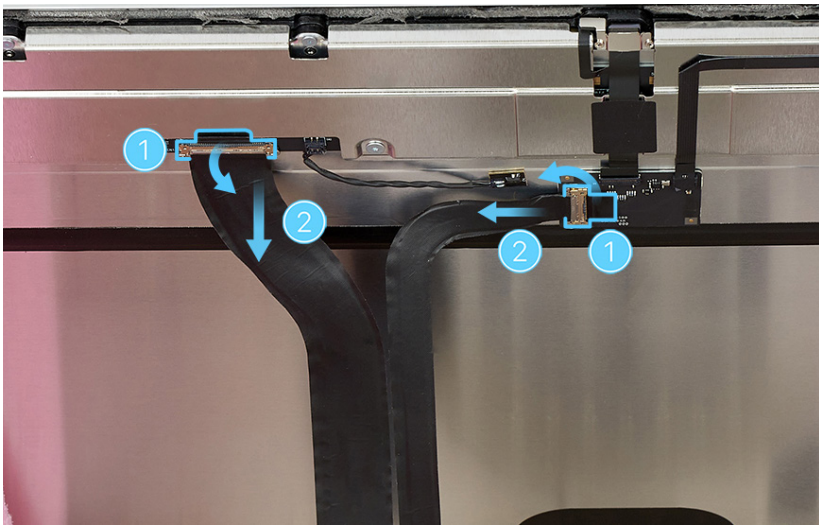
© 2022 Apple Inc. All rights reserved.

11. Peel the polyester film tape from the display backlight flex cable (1) and save it for reassembly. Pull the end of the display backlight flex cable straight down and out of the connector (2).



12. Flip up the locking levers of the camera and embedded DisplayPort (eDP) flex cable connectors (1). Slide both ends of the eDP flex cable out of their connectors (2).

 Note: The camera and eDP flex cable is a single cable with three ends. The third end connects to the logic board.



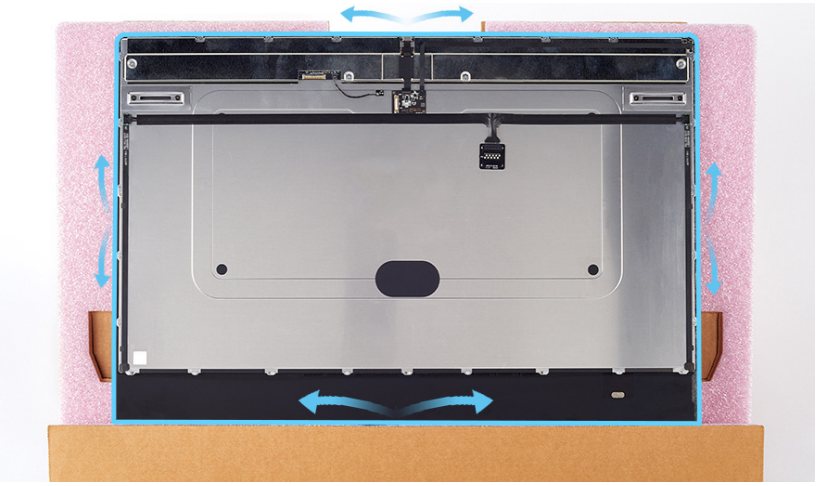
13. Lift the display off the support wedges and set it on the display support stand.

© 2022 Apple Inc. All rights reserved.

14. Peel the display adhesive from the edges of the display.

Caution

To prevent damage to the polyester film on the display, don't peel residual adhesive from the corners of the display.



15. Use an ethanol wipe or IPA wipe to remove any remaining display adhesive from the edges of the display. Allow the surfaces to dry for at least 1 minute.

Caution

Don't use ethanol wipes or IPA wipes on the front of the display or to remove anything other than residual display adhesive.

16. Peel the display adhesive from the edges of the housing.

17. Use an ethanol wipe or IPA wipe to remove any remaining display adhesive from the edges of the housing. Allow the surfaces to dry for at least 1 minute.



18. Use Kapton tape to secure the camera and eDP flex cable and display backlight flex cable to the housing.

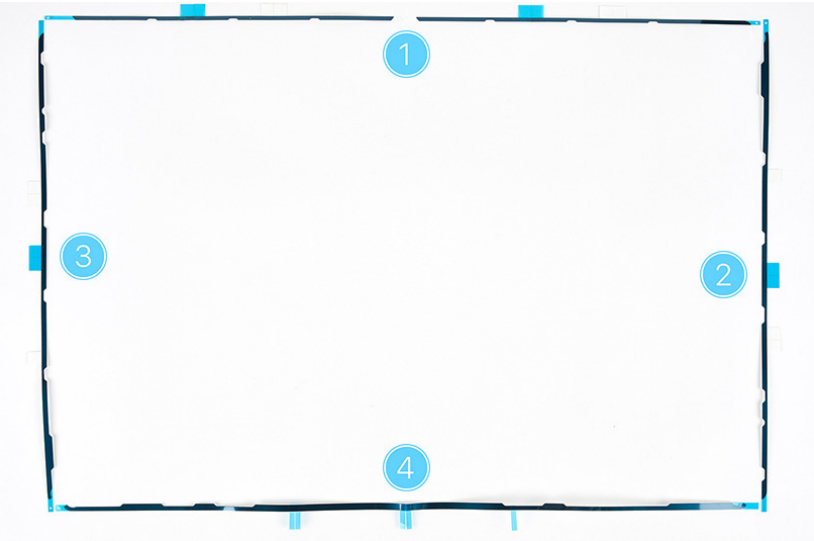
© 2022 Apple Inc. All rights reserved.

Reassembly

Caution

The bottom adhesive strip is model specific. Ensure that you have the correct bottom adhesive strip for the model you're repairing.

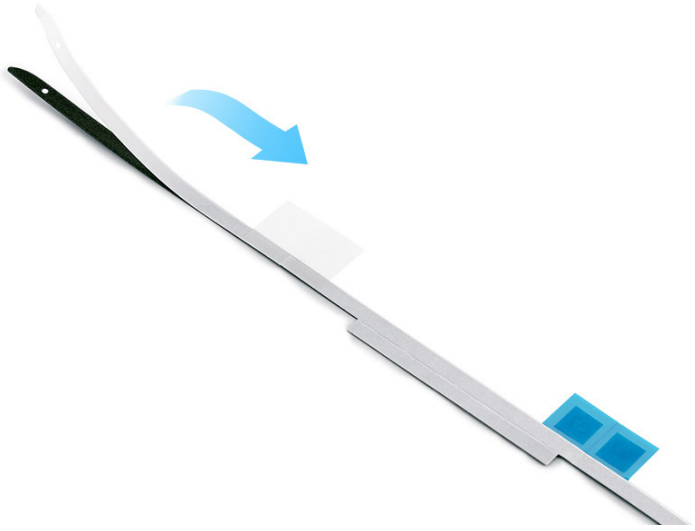
1. Place the display adhesive strips on a flat surface and check them for damage and wrinkles.
 - 946-25206 (1)
 - 946-25207 (2)
 - 946-25208 (3)
 - 946-18118 (4)



Caution

Damaged strips can cause cosmetic gaps and light leakage. They can also weaken the bond between the display and the housing. If the adhesive strips are damaged or wrinkled, replace them.

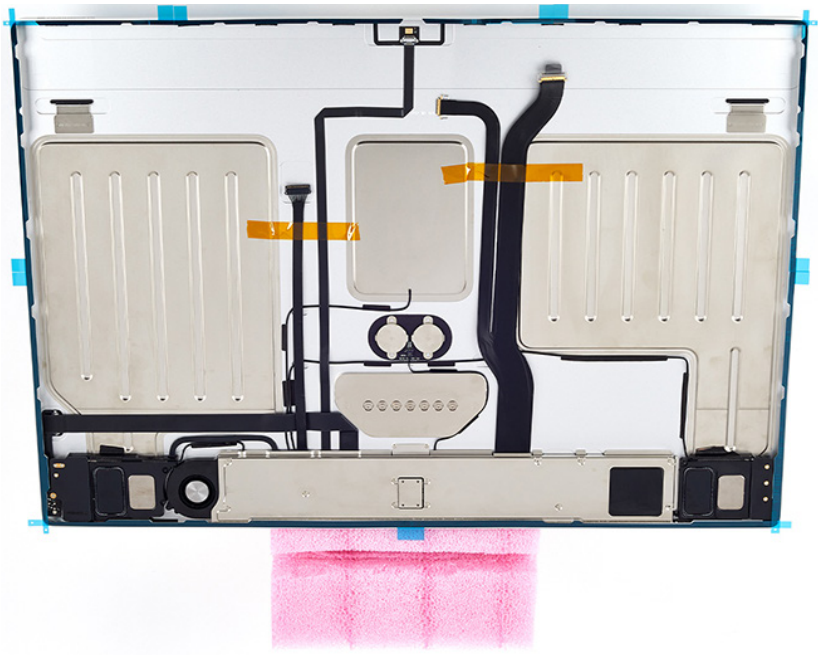
Note: The display adhesive strips have two layers of adhesive with a foam layer between them. There is a paper release liner on the underside and a plastic release liner on the top side. The colors of the release liners may vary.



© 2022 Apple Inc. All rights reserved.

2. Lay the housing flat as shown. Peel off a short section of the paper release liner from one display adhesive strip.

 Note: If the computer has a VESA mount adapter, lay the computer flat on the VESA support wedge.



Important

Don't remove the plastic release liners on the display adhesive strips yet.

3. Align the display adhesive strip with the corresponding edge of the housing and press the exposed adhesive onto the housing.

4. As you continue to align the display adhesive strip, peel off sections of the paper release liner and press the adhesive to the edge of the housing until the entire strip adheres.

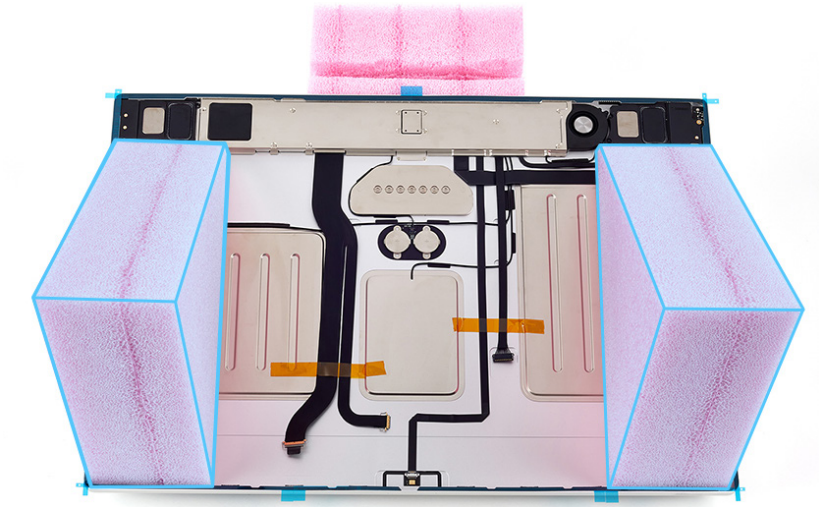
© 2022 Apple Inc. All rights reserved.

5. Repeat steps 2 through 4 to install the remaining display adhesive strips.

6. Inspect the alignment of the display adhesive strips. Ensure that there are no wrinkles or air pockets.

7. Rotate the housing so the top edge is closest to you. Position the support wedges in the housing as shown.

8. Peel the Kapton tape from the camera and eDP flex cable and display backlight flex cable.

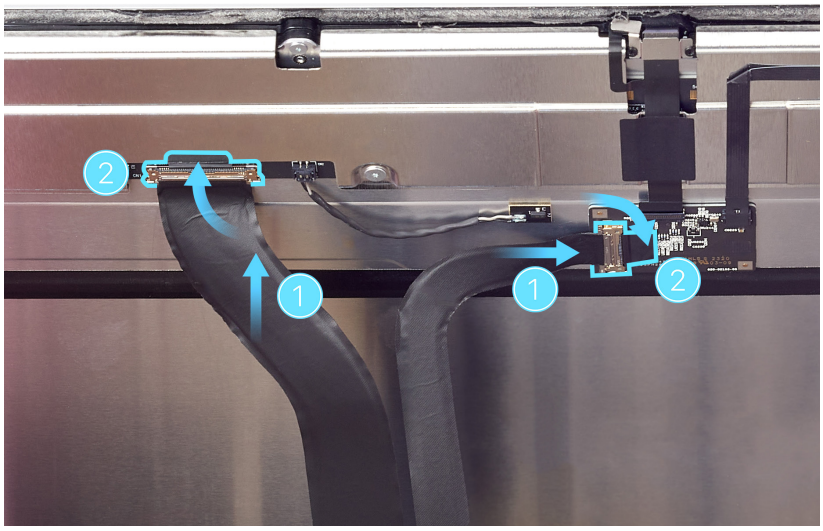


9. Insert the bottom edge of the display into the slot in the stand support wedge. Rest the display on the triangle support wedges.



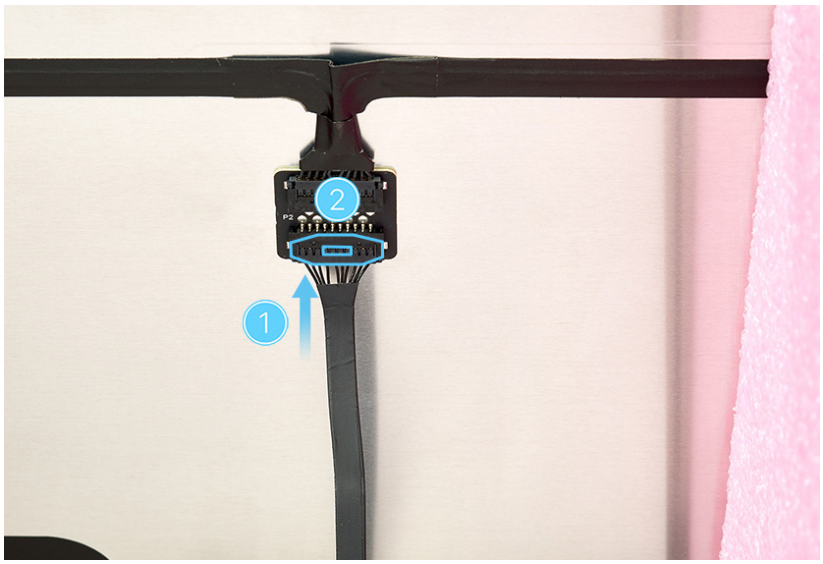
© 2022 Apple Inc. All rights reserved.

10. Slide the two ends of the camera and eDP flex cable into the connectors (1) on the back of the display. Then flip down the locking levers (2).



11. Slide the end of the display backlight flex cable into the connector on the back of the display (1).

12. Adhere the tape onto the display backlight flex cable connector (2).

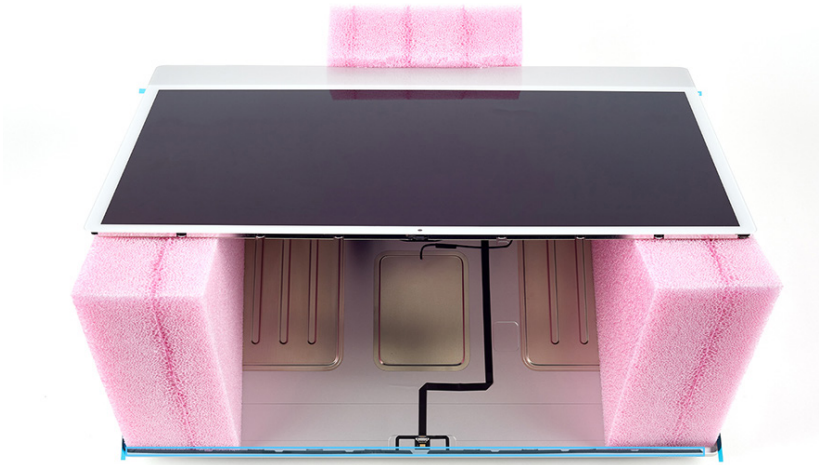


Important

If the tape was damaged during removal, discard it and use replacement tape.

© 2022 Apple Inc. All rights reserved.

13. Slightly lift the top edge of the display. Remove the two triangle support wedges from the housing.



14. Slowly pull the display out of the slot in the stand support wedge (1). Then lower the top edge of the display toward the housing (2).

Caution

Don't strain the flex cables as you move the display.

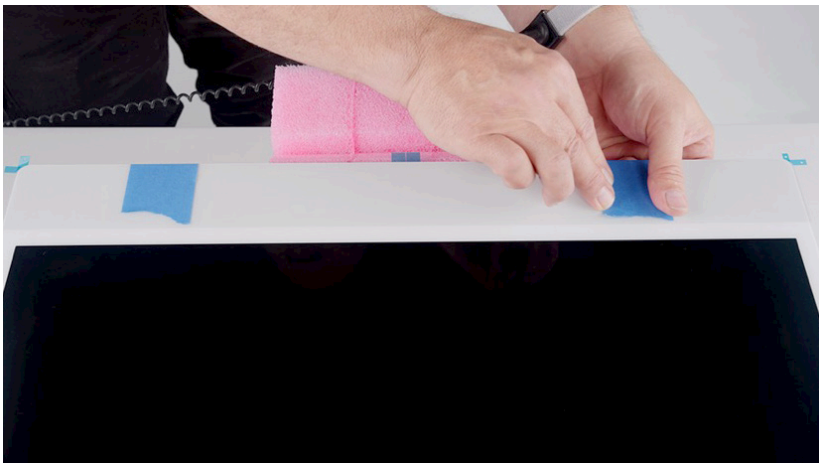


© 2022 Apple Inc. All rights reserved.

15. Position the display flat on the housing. The top edge of the display should hang just over the top edge of the housing.



16. Apply two strips of painters tape to the bottom of the computer to temporarily secure the display to the housing.



© 2022 Apple Inc. All rights reserved.

17. Hold the display flush against the housing as you carefully stand up the computer. The display will shift slightly as it hooks onto the display hangers and aligns with the edges of the housing.

 Note: If your computer has a VESA mount adapter, stand the computer upright in the display support stand.

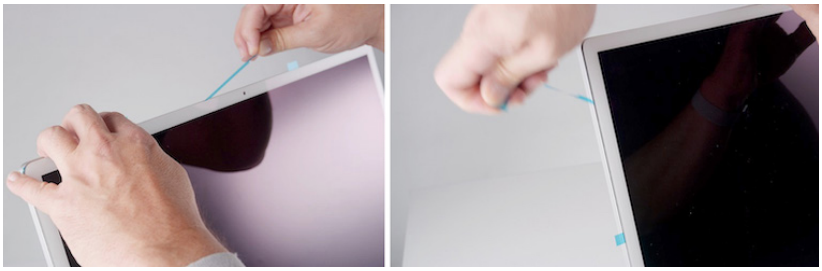


Caution

The display is only partially held in place by the display hangers in the housing. Hold the display flush against the housing to ensure that the display doesn't fall off the display hangers.

18. Ensure that the display and housing are aligned on all four sides. Then carefully adjust the two strips of painters tape so they fit snugly over the bottom of the computer.

19. Separate the display just enough to remove the release liners from the four display adhesive strips on the top half of the computer.



Caution

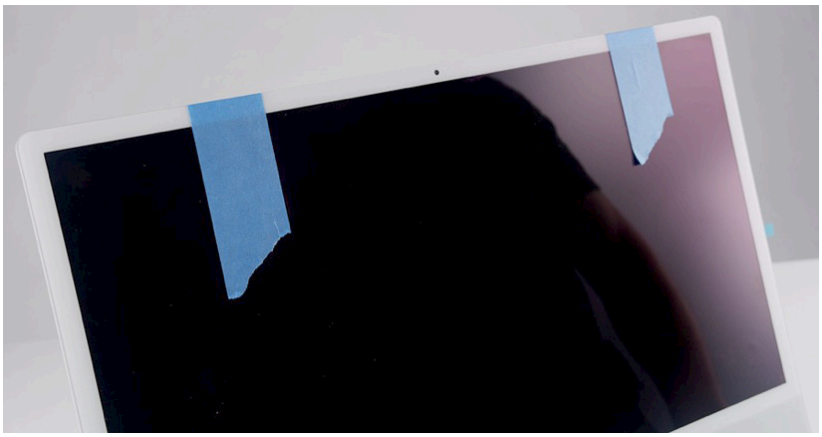
If the display separates too much from the housing, the display will unhook from the display hangers and may fall off the housing.

© 2022 Apple Inc. All rights reserved.

20. Press the top of the display to adhere it to the display adhesive strips on the housing.



21. Apply two strips of painters tape to the top of the computer to temporarily secure the display to the housing.



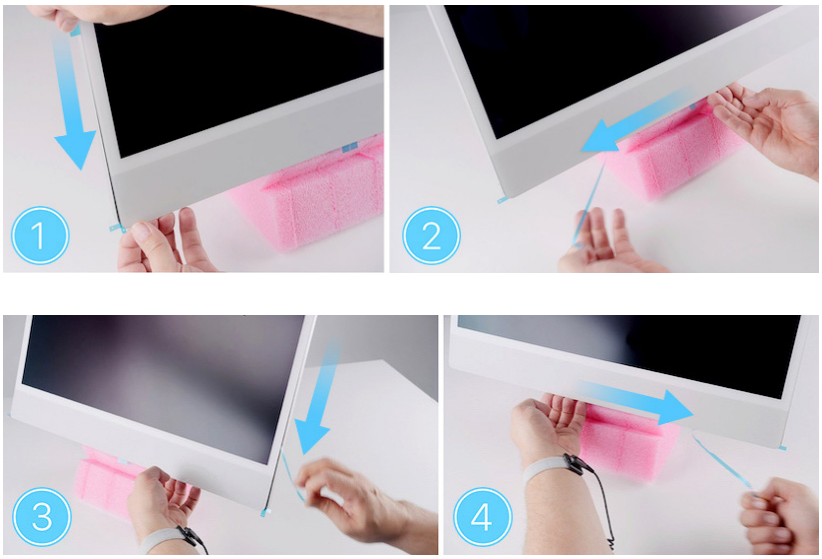
22. Remove the two strips of painters tape from the bottom of the computer.



© 2022 Apple Inc. All rights reserved.

23. Separate the display from the housing just enough to remove the release liners from the four display adhesive strips on the bottom half of the computer. Start near the middle and peel the release liners toward the bottom corners of the computer in the order shown.

 Note: If the computer has a VESA mount adapter, lay the computer flat on the VESA support wedge.



Caution

If the display separates too much from the housing, the display will unhook from the display hangers and may fall off the housing.

24. Press the bottom of the display to adhere it to the display adhesive strips on the housing.



© 2022 Apple Inc. All rights reserved.

25. Ensure that the four edges of the display and housing are aligned. If they aren't aligned, repeat the removal and reassembly steps.



26. Remove the two strips of painters tape from the top of the computer.

27. Remove the liner from the sticky sheet pad. Roll the silicone roller back and forth on the sticky sheet pad to clean it.



© 2022 Apple Inc. All rights reserved.

28. Roll the sticky silicone roller back and forth along all four edges of the display to adhere the display adhesive strips.

 Note: If the computer has a VESA mount adapter, stand the computer upright in the display support stand.





© 2022 Apple Inc. All rights reserved.

29. Clean the display with the microterry polishing cloth.



30. Remove the stand wedge.



Caution

- After you've completed all removal and reassembly steps, learn how to initiate the System Configuration process at support.apple.com/self-service-repair.
- System Configuration is required if you've installed a replacement display or logic board.
- If you replaced the logic board, the computer will start up in Diagnostics mode until you complete System Configuration.
- If you replaced the display, the display's brightness and True Tone may not function properly until you complete System Configuration.

© 2022 Apple Inc. All rights reserved.

Battery Board and Batteries

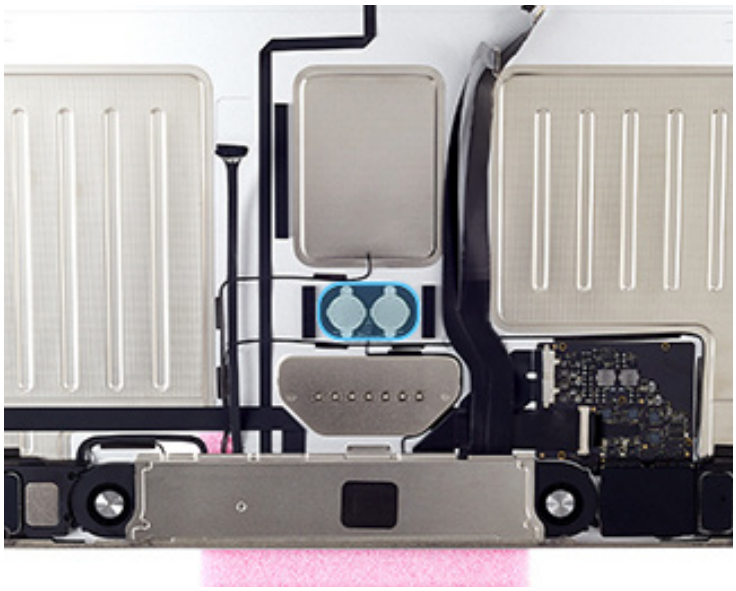
Before You Begin

Remove the following part before you begin:

- Display

Tools

- ESD-safe tweezers
- Ethanol wipes or isopropyl alcohol (IPA) wipes
- Nylon probe (black stick)
- Support wedges



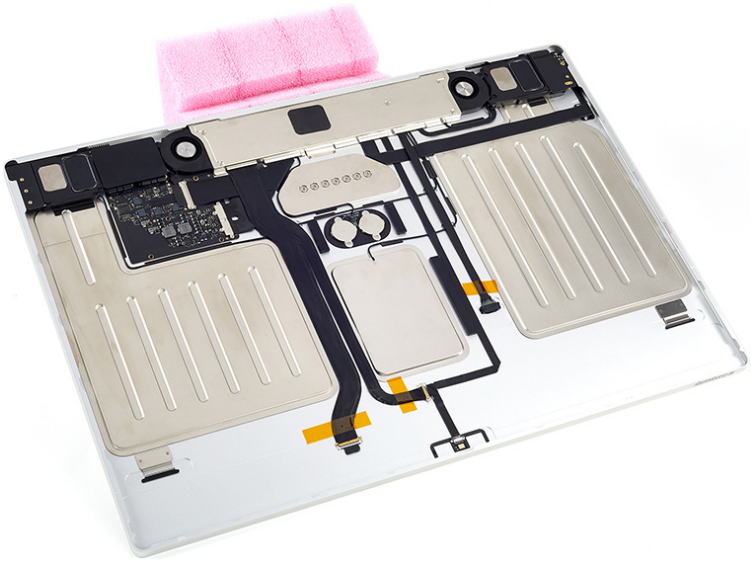
Important

This model requires two CR2016 batteries. Replacement batteries can be purchased from electronics supply retailers.

© 2022 Apple Inc. All rights reserved.

Removal

1. Position the housing with the back facedown and the top closest to you.



2. Position the pointed end of the black stick underneath the battery cable and close to the connector. Hold the battery cable in place against the black stick and lift the end of the battery cable off the connector.



© 2022 Apple Inc. All rights reserved.

3. Use ESD-safe tweezers to grasp the battery adhesive tab and gently peel it from the battery board.



4. Use ESD-safe tweezers to grasp the battery adhesive tab. Keep the tweezers close and parallel to the housing. Then slowly twist the tweezers to wrap the adhesive around them.

Caution

Don't pull the battery adhesive strip upward.



© 2022 Apple Inc. All rights reserved.

5. Pull the tweezers outward as shown. As the battery adhesive strip stretches, continue to slowly pull and twist the tweezers until you have removed the entire strip.

 Note: Hold the battery board in place as it loosens.



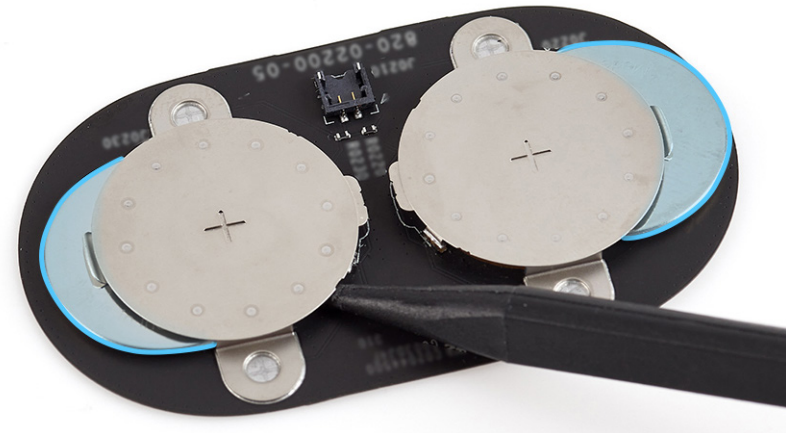
Caution

If the battery adhesive strip breaks and can't be retrieved, don't forcibly pry the battery board. Stop the repair and reassemble the computer. For service, visit support.apple.com/repair.

6. Remove the battery board from the housing and place it on an ESD-safe surface.

7. Turn over the battery board. Peel off any remaining adhesive. Use an ethanol wipe or IPA wipe to clean any adhesive residue from the back of the battery board.

8. Use the black stick to gently push the batteries outward to remove the batteries from the battery board.



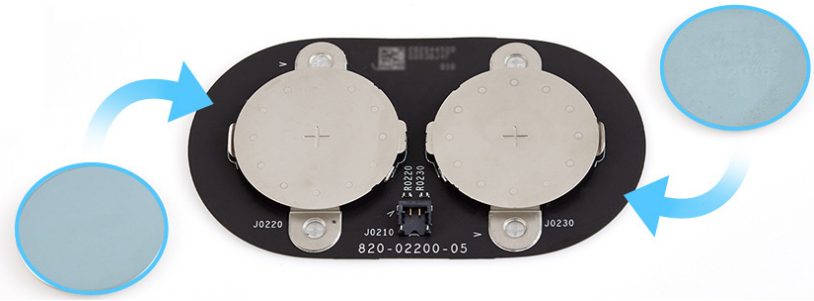
© 2022 Apple Inc. All rights reserved.

Reassembly

Warning

Install only a CR2016 battery. There is a risk of explosion if the battery is installed incorrectly or replaced with an incorrect type of battery. Dispose of used batteries according to local environmental laws and guidelines.

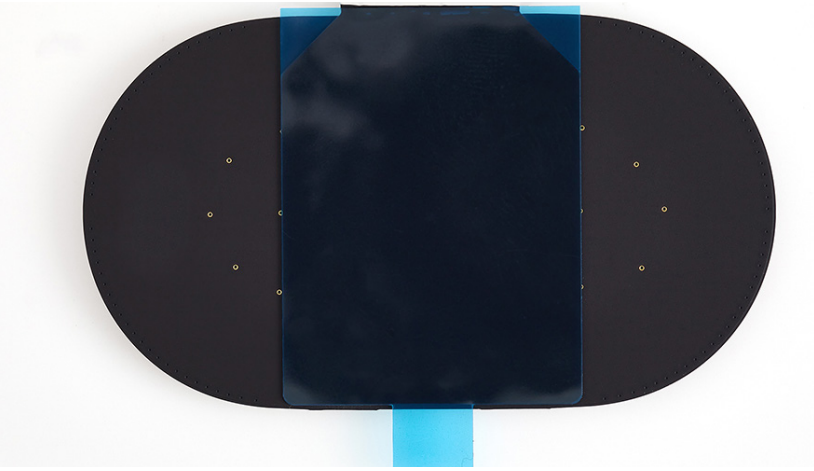
1. If you removed the batteries or are installing new batteries, slide the batteries positive (+) side up into the battery compartments on the battery board.



2. If you reinstall the same battery board, apply a new adhesive strip to the back of the battery board as shown. Fold down the adhesive tab between the batteries (1).



3. Peel the large blue release liner from the back of the battery board to expose the battery board adhesive.



© 2022 Apple Inc. All rights reserved.

4. Align the top edge of the battery board with the cutout in the housing. Then lay down the battery board.

5. Press and hold the battery board for 15 seconds in the areas shown in blue to adhere it to the housing.



Caution

Don't press on the battery compartments.

6. Press the end of the battery cable to the connector.



Reinstall the following part to complete reassembly:

- Display

© 2022 Apple Inc. All rights reserved.

Logic Board Cover

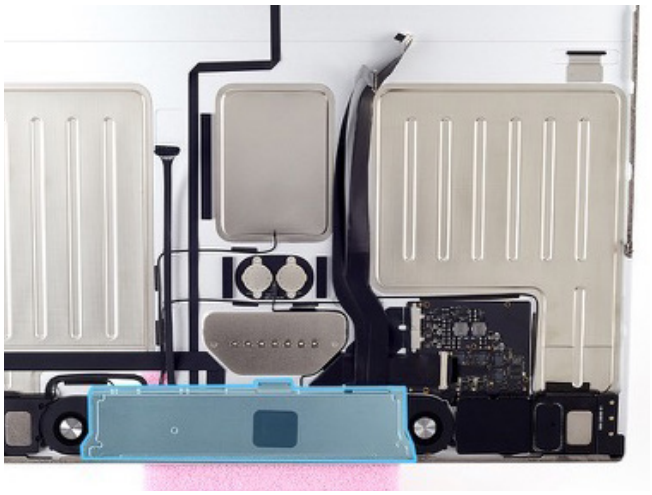
Before You Begin

Remove the following part before you begin:

- Display

Tools

- Support wedges
- Torx T3 screwdriver



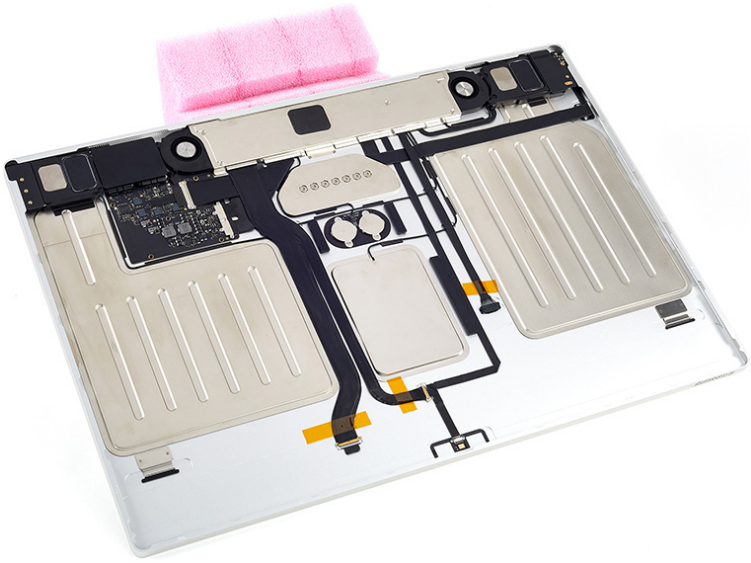
Important

This procedure may require replacement tape. Replacement tape is included in the display starter kit and display refill kit. It's not a separate orderable part.

© 2022 Apple Inc. All rights reserved.

Removal

1. Position the housing with the back facedown and the top closest to you.



2. Peel the tape off the middle of the logic board cover. Save the tape for reassembly.



© 2022 Apple Inc. All rights reserved.

3. Use the T3 screwdriver to remove the 11 T3 screws (923-05557) from the logic board cover.



4. Tilt up the logic board cover. Then pull it toward you to remove it from the housing.

Caution

Don't touch the logic board with the logic board cover.



© 2022 Apple Inc. All rights reserved.

Reassembly

1. Look for foam on the underside of the logic board cover where the speaker cables connect to the logic board.
 - If the logic board cover has foam, don’t adhere foam over the speaker cable connectors on the logic board.
 - If the logic board cover doesn’t have foam, adhere foam over the speaker cable connectors on the logic board.

2. Slide the logic board cover into the housing. Then reposition it over the logic board.

Caution

Don’t touch the logic board with the logic board cover.



3. Use the T3 screwdriver to reinstall the 11 T3 screws (923-05557) into the logic board cover.



© 2022 Apple Inc. All rights reserved.

4. Adhere the tape onto the middle of the logic board cover.

Important

If the tape was damaged during removal, discard it and use replacement tape.



Reinstall the following part to complete reassembly:

- Display

© 2022 Apple Inc. All rights reserved.

Stand

Before You Begin

Remove the following part before you begin:

- Display

Tools

- Adjustable torque driver (1.2-3 Nm)
- Support wedges
- Torx Plus 10IP bit



Important

This procedure requires alignment pins, which only come with a new stand. They aren't separate orderable parts.

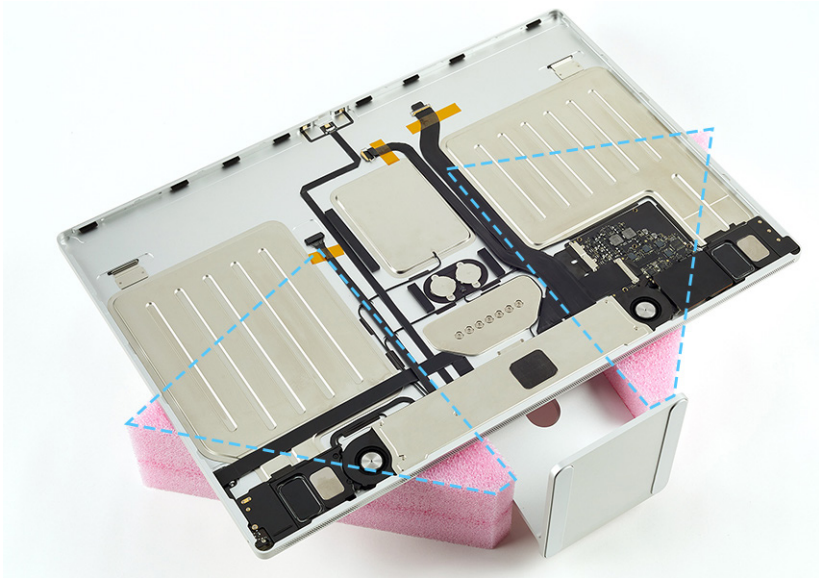
© 2022 Apple Inc. All rights reserved.

Removal

1. Remove the stand support slot wedge from the stand.



2. Lay the triangle support wedges used for display removal on their sides. Then place the housing on top of them as shown with the back of the housing facing down and the stand positioned between the triangle support wedges.



3. Insert the Torx Plus 10IP bit into the 1.2-3 Nm adjustable torque driver.

© 2022 Apple Inc. All rights reserved.

4. Use the adjustable torque driver and Torx Plus 10IP bit to remove the seven 10IP screws in the order shown.

 Note: The left two screws (4, 6) are shorter than the other five (1–3, 5, 7).

 - (923-05554) (1–3, 5, 7)
 - (923-06114) (4, 6)

Caution

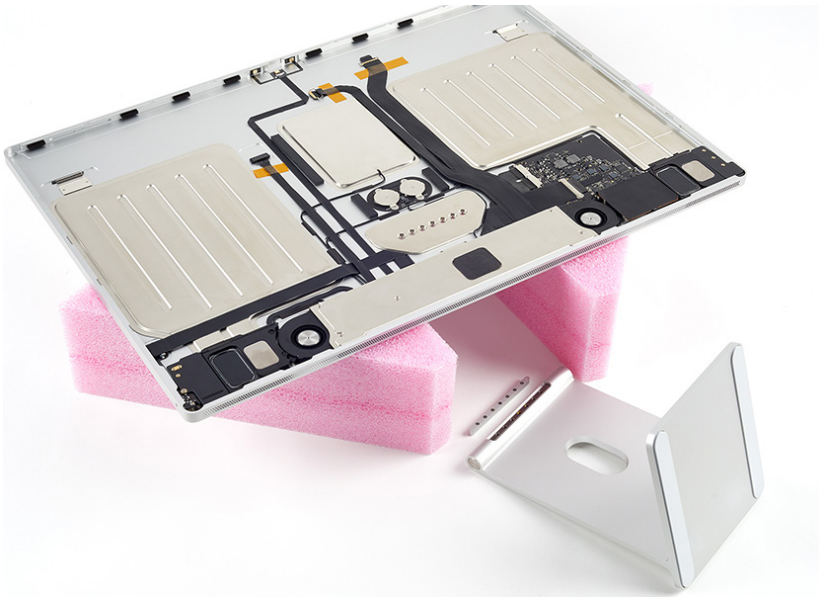
Push down firmly when removing the screws to avoid stripping the screw heads.





© 2022 Apple Inc. All rights reserved.

5. Remove the flange and stand from under the housing.



© 2022 Apple Inc. All rights reserved.

Reassembly

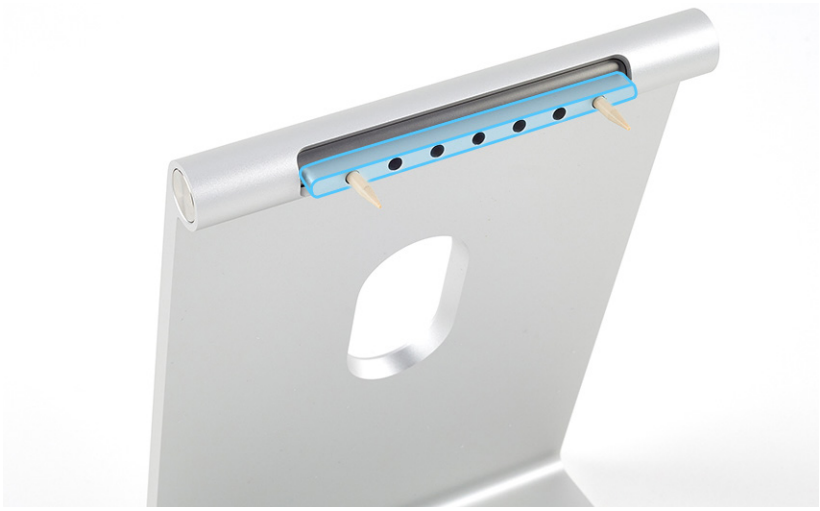
Note: If you're swapping a stand for a VESA mount adapter, follow the reassembly steps in the VESA mount adapter procedure.

1. Position the stand upright.

2. Firmly press the two alignment pins into the outer screw holes of the stand.



3. Install the flange over the alignment pins.



© 2022 Apple Inc. All rights reserved.

4. Lift the housing. Then position the housing so the alignment pins line up with the outer screw holes of the housing.

5. Move the housing so the alignment pins insert into the two outer screw holes of the housing.

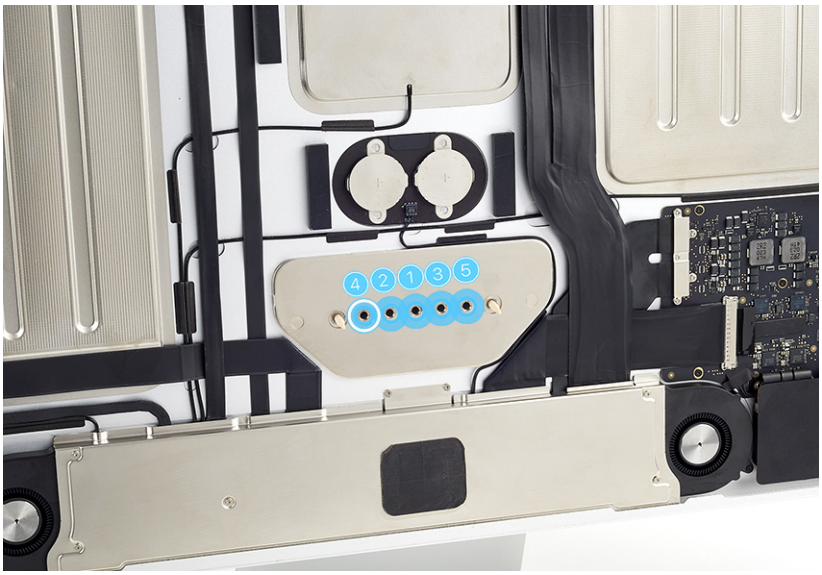


6. Insert the Torx Plus 10IP bit into the 1.2-3 Nm adjustable torque driver. Set the torque value to 1.4 Nm.

7. Use the adjustable torque driver and Torx Plus 10IP bit to partially reinstall five 10IP screws in the order shown.

 Note: One of the screws (4) is shorter than the other screws.

 - (923-05554) (1–3, 5)
 - (923-06114) (4)

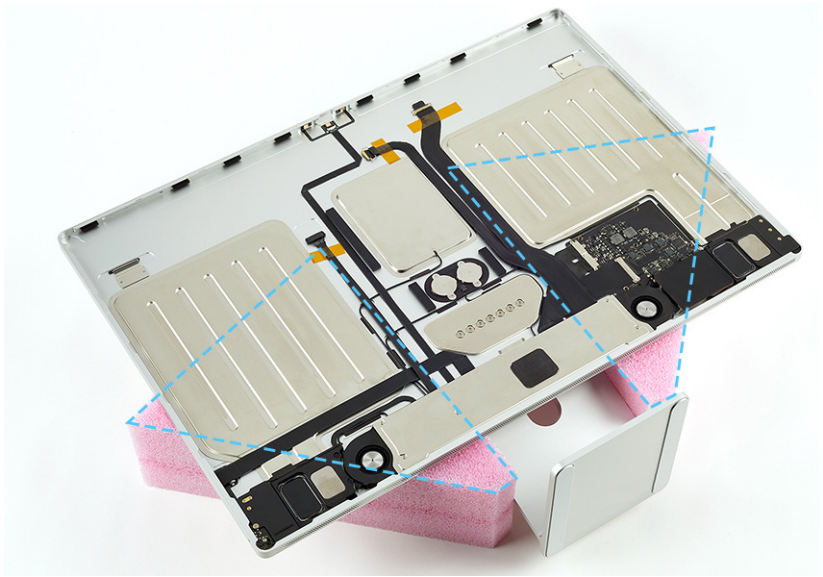


© 2022 Apple Inc. All rights reserved.

8. Remove the alignment pins by rotating them counterclockwise and pulling them out of the housing.



9. Lay the triangle support wedges on their sides. Then place the housing on top of them as shown with the back of the housing facing down and the stand positioned between the triangle support wedges.



© 2022 Apple Inc. All rights reserved.

10. Use the adjustable torque driver and Torx Plus 10IP bit to partially reinstall the remaining two 10IP screws in the outer screw holes.

 Note: One screw (6) is shorter than the other screw.

 - (923-06114) (6)
 - (923-05554) (7)



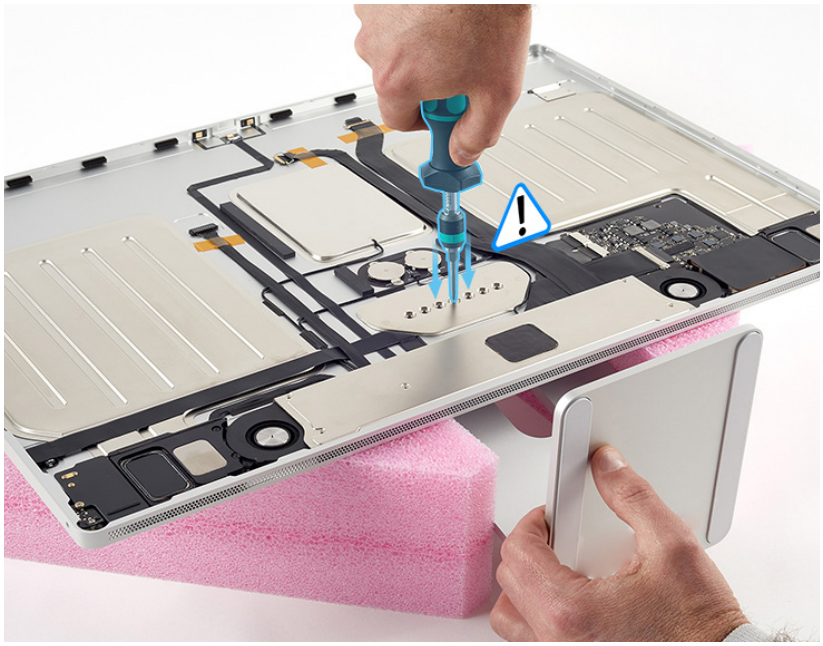
© 2022 Apple Inc. All rights reserved.

11. Use the adjustable torque driver and Torx Plus 10IP bit to fully reinstall the seven 10IP screws in the order shown.

Caution

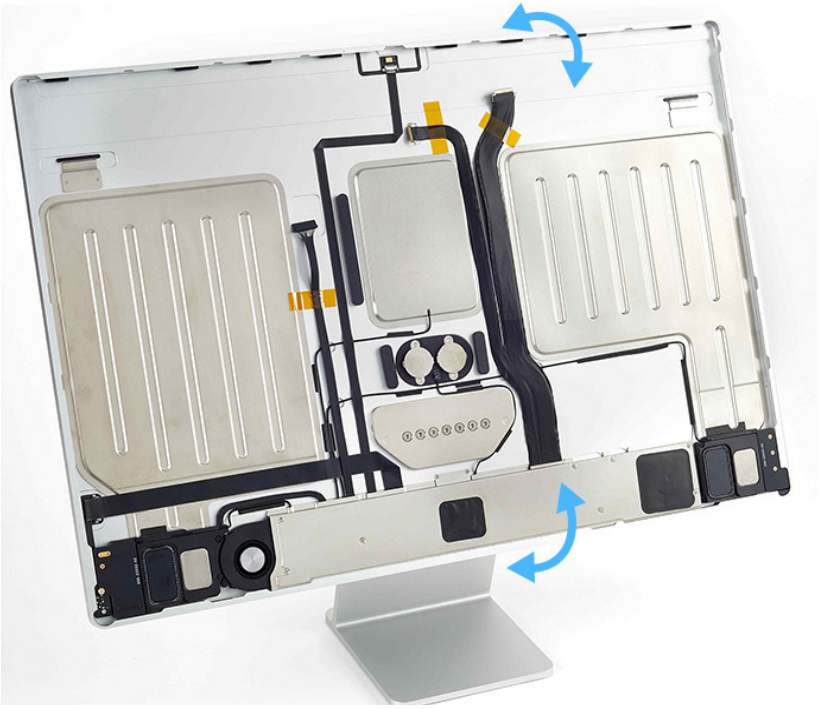
Push down firmly when tightening the screws to avoid stripping the screw heads.





© 2022 Apple Inc. All rights reserved.

12. Place the computer upright. Hold the top and bottom edges of the housing. Then gently push the housing back and forth to ensure that it tilts back and forth smoothly.



Reinstall the following part to complete reassembly:

- Display

© 2022 Apple Inc. All rights reserved.

USB-C Boards

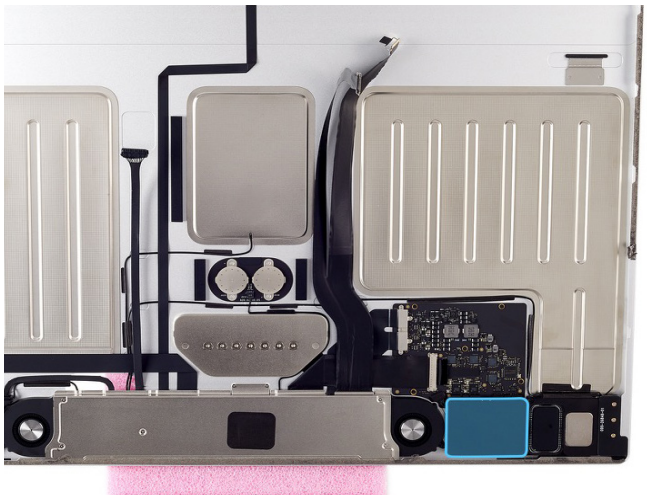
Before You Begin

Remove the following part before you begin:

- Display

Tools

- Nylon probe (black stick)
- Support wedges
- Torx T3 screwdriver

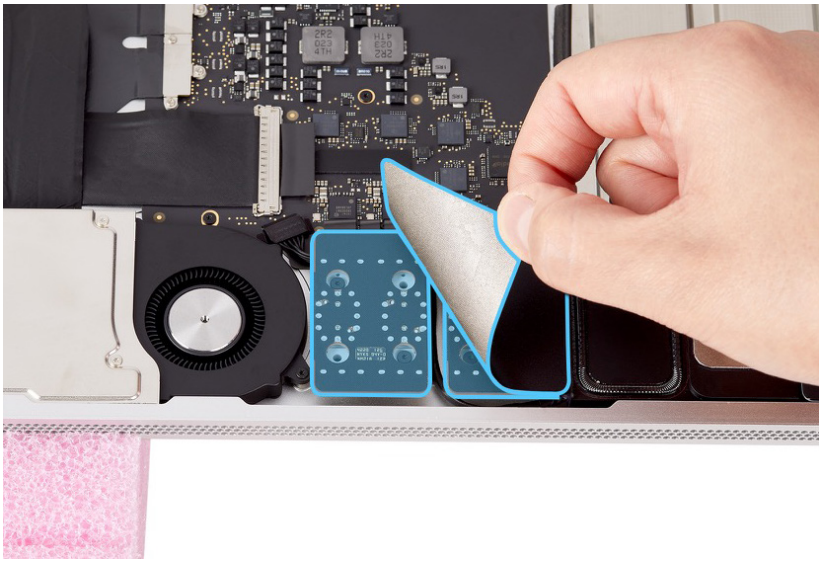


© 2022 Apple Inc. All rights reserved.

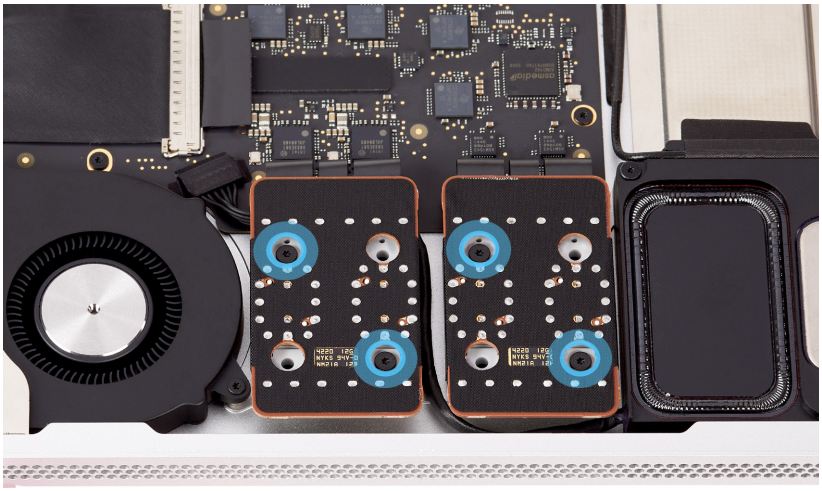
Removal

Note: The following steps describe how to remove both USB-C boards. However, you can remove one USB-C board at a time.

1. Peel off the polyester film tape from the USB-C boards. Save it for reassembly.



2. Use the T3 screwdriver to remove the two T3 screws (923-05555) from each USB-C board.

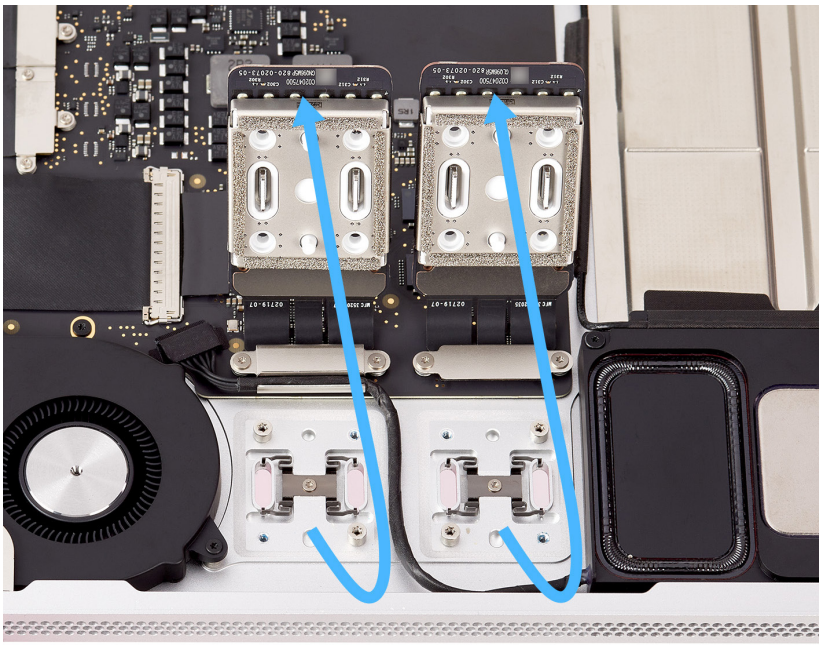


© 2022 Apple Inc. All rights reserved.

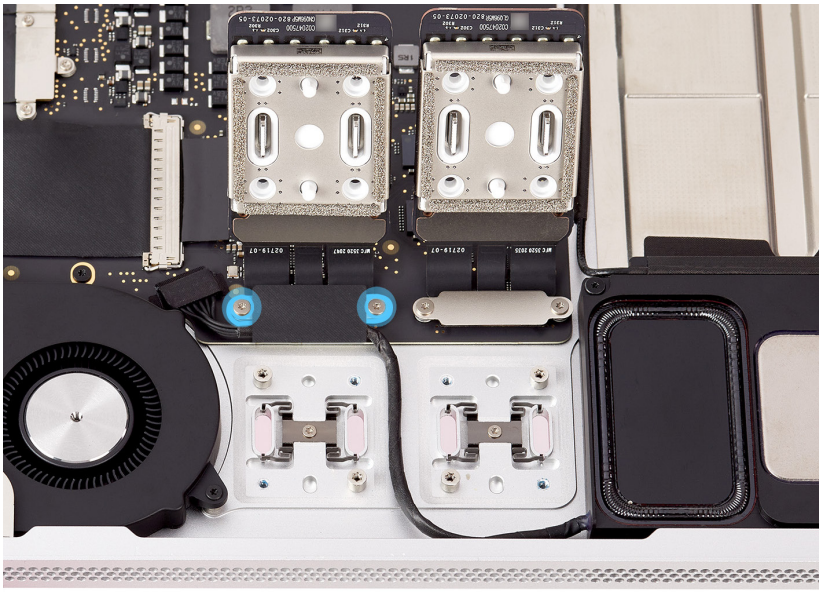
3. Flip up the USB-C boards to access the USB-C board cowlings.

Caution

Ensure that the USB-C boards don't touch the adpater board.



4. Use the T3 screwdriver to remove the two T3 screws (923-05562) from each cowling.



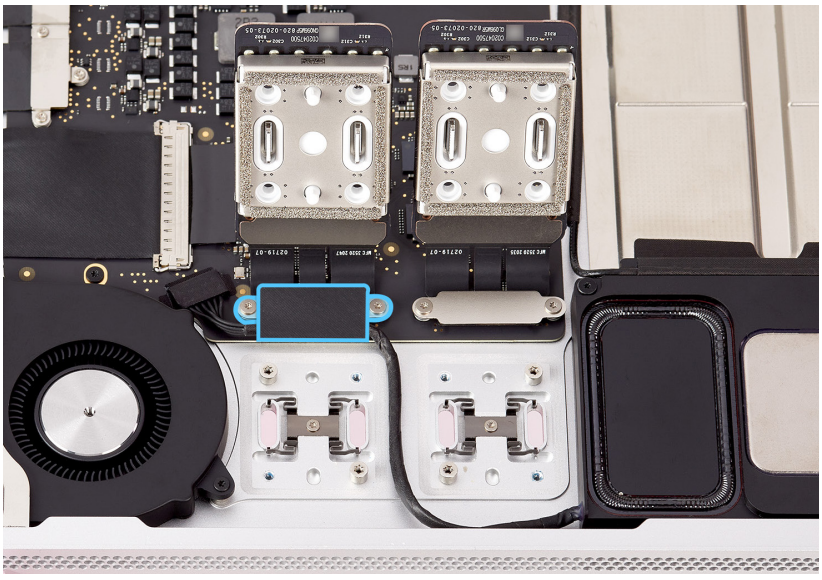
© 2022 Apple Inc. All rights reserved.

5. Remove the right cowling and save it for reassembly.



6. Gently move the left cowling and speaker cable out of the way to access the left USB-C board connector.

 Note: The speaker cable is routed through the left USB-C board cowling and is secured with tape.

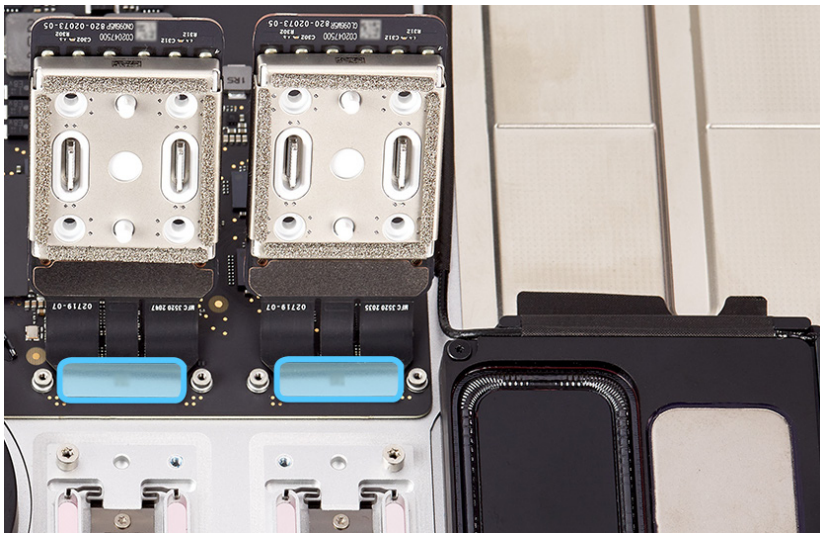


Caution

Ensure that the USB-C boards don't touch the adpater board.

© 2022 Apple Inc. All rights reserved.

7. Use the flat end of the black stick to lift the ends of the USB-C board flex cables off the connectors on the adapter board.



8. Remove the USB-C boards from the housing.

© 2022 Apple Inc. All rights reserved.

Reassembly

1. Position the USB-C boards over the connectors. Then press the ends of the USB-C board flex cables to the connectors on the adapter board.

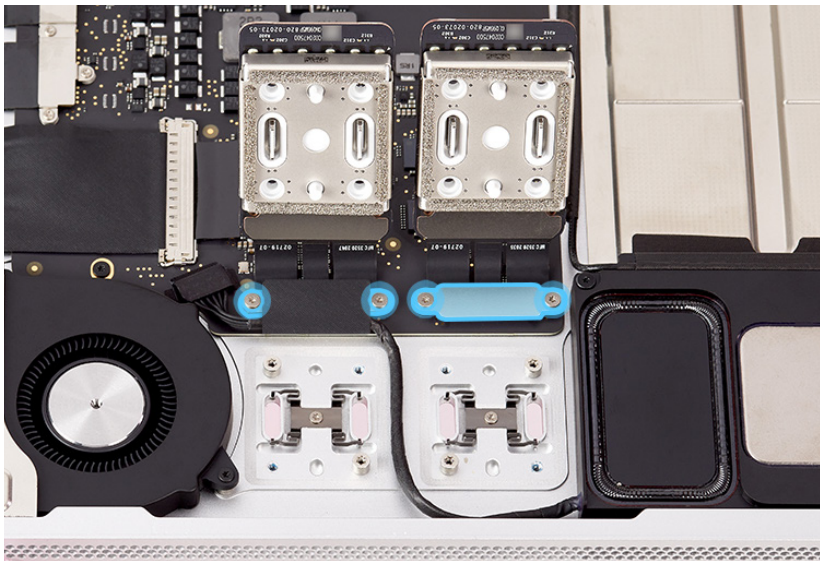
Caution

Ensure that the USB-C boards don't touch the adpater board.



2. Position the USB-C board cowlings over the connectors.

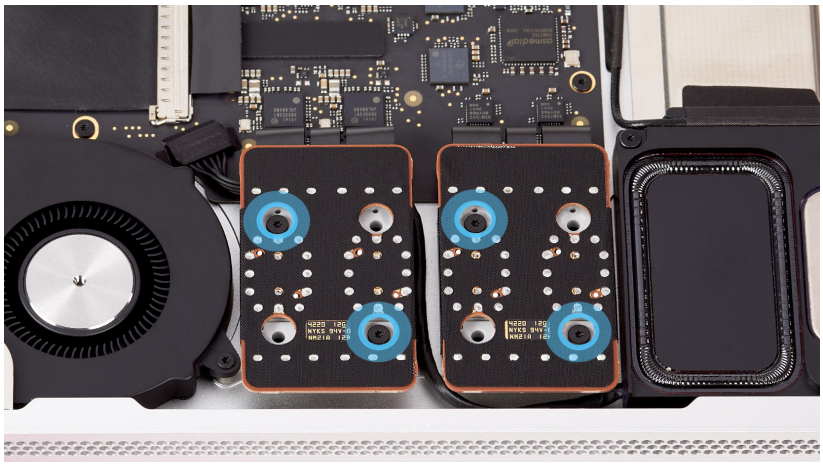
3. Use the T3 screwdriver to reinstall the two T3 screws (923-05562) into each cowling.



© 2022 Apple Inc. All rights reserved.

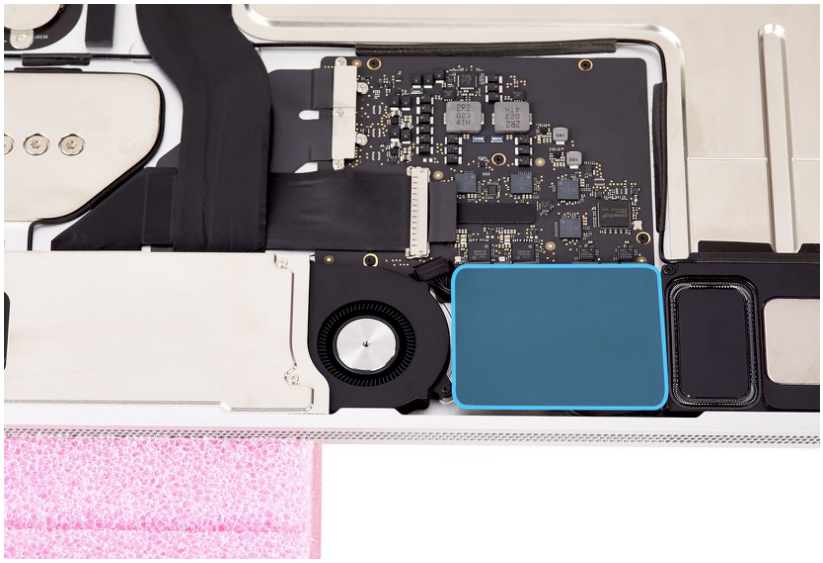
4. Flip down the USB-C boards. Ensure that they are aligned with the screw holes.

5. Use the T3 screwdriver to reinstall the two T3 screws (923-05555) into each USB-C board as shown.



6. Reinstall the polyester film tape over the USB-C boards.

 Note: If you're installing a replacement USB-C board, use the included replacement polyester film tape instead of the existing polyester film tape.



Reinstall the following part to complete reassembly:

- Display

© 2022 Apple Inc. All rights reserved.

VESA Mount Adapter

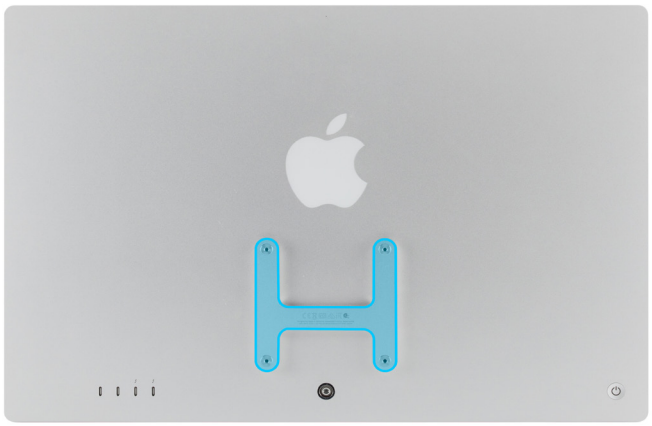
Before You Begin

Remove the following part before you begin:

- Display

Tools

- Adjustable torque driver (1.2-3 Nm)
- Support wedges
- Torx Plus 10IP bit



Important

This procedure requires alignment pins, which only come with a new VESA mount adapter. They aren't separate orderable parts.

© 2022 Apple Inc. All rights reserved.

Removal

1. Lay the computer flat in the VESA support slot wedge with the back of the housing facing down and the logic board closest to you.

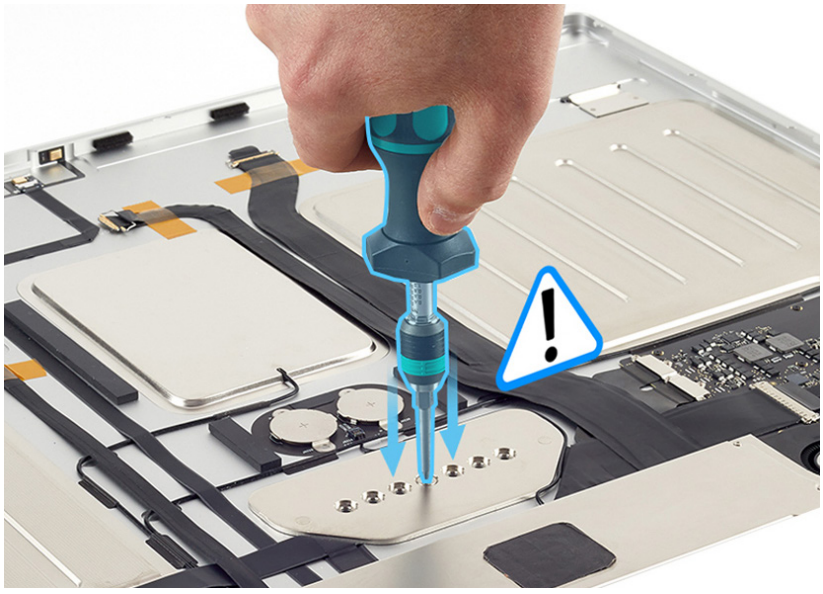
2. Insert the Torx Plus 10IP bit into the 1.2-3 Nm adjustable torque driver.

3. Use the adjustable torque driver and Torx Plus 10IP bit to remove the seven 10IP screws (923-05554) in the order shown.

Caution

Push down firmly when removing the screws to avoid stripping the screw heads.





© 2022 Apple Inc. All rights reserved.

4. Lift the computer off the support stand.

 Note: The VESA mount and VESA flange will remain in the VESA support slot wedge.



© 2022 Apple Inc. All rights reserved.

Reassembly

Note: If you're swapping a VESA mount adapter for a stand, follow the reassembly steps in the stand reassembly procedure.

1. Firmly press the two alignment pins into the outer screw holes in the middle of the VESA mount adapter.

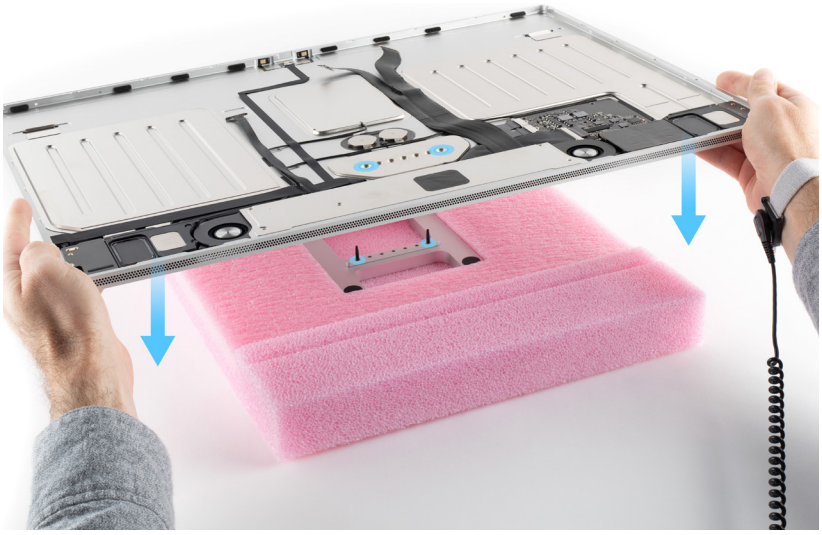


2. Install the flange over the alignment pins and onto the VESA mount adapter.



© 2022 Apple Inc. All rights reserved.

3. Lift the housing. Then align the housing so the screw holes line up with the alignment pins.



4. Slide the housing onto the alignment pins. Ensure that the alignment pins enter the outer screw holes of the housing.



5. Insert the Torx Plus 10IP bit into the 1.2-3 Nm adjustable torque driver. Set the torque value to 1.4 Nm.

© 2022 Apple Inc. All rights reserved.

6. Use the adjustable torque driver and Torx Plus 10IP bit to partially reinstall the seven 10IP screws (923-05554) in the order shown.



Caution

Push down firmly when installing the screws to avoid stripping the screw heads.



7. Use the adjustable torque driver and Torx Plus 10IP bit to fully reinstall the seven 10IP screws.

Reinstall the following part to complete reassembly:

- Display

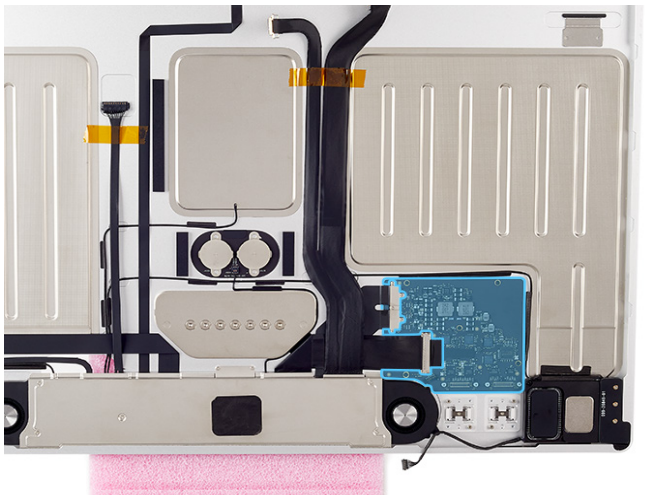
© 2022 Apple Inc. All rights reserved.

Adapter Board

Before You Begin

Remove the following parts before you begin:

- Display
- USB-C boards



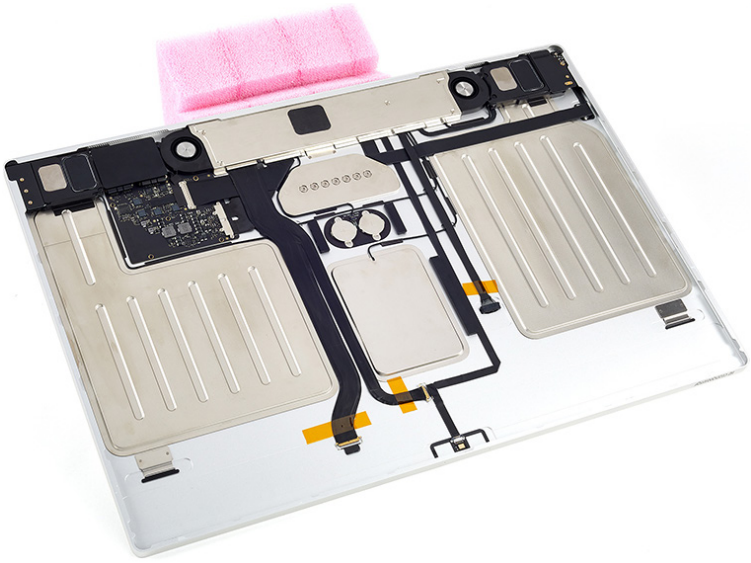
Tools

- Nylon probe (black stick)
- Support wedges
- Torx T3 screwdriver

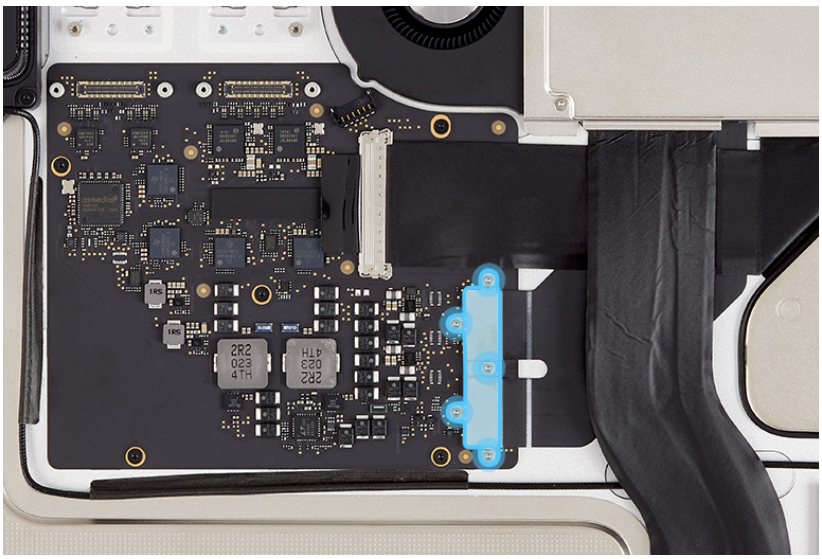
© 2022 Apple Inc. All rights reserved.

Removal

1. Position the housing with the back facedown and the top closest to you.



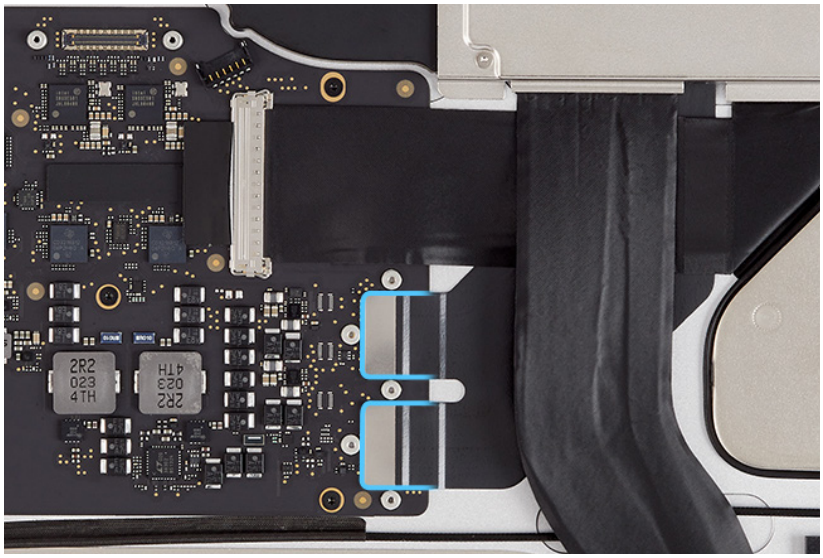
2. Use the T3 screwdriver to remove the five T3 screws (923-05559) from the low-speed flex cable cowling.



© 2022 Apple Inc. All rights reserved.

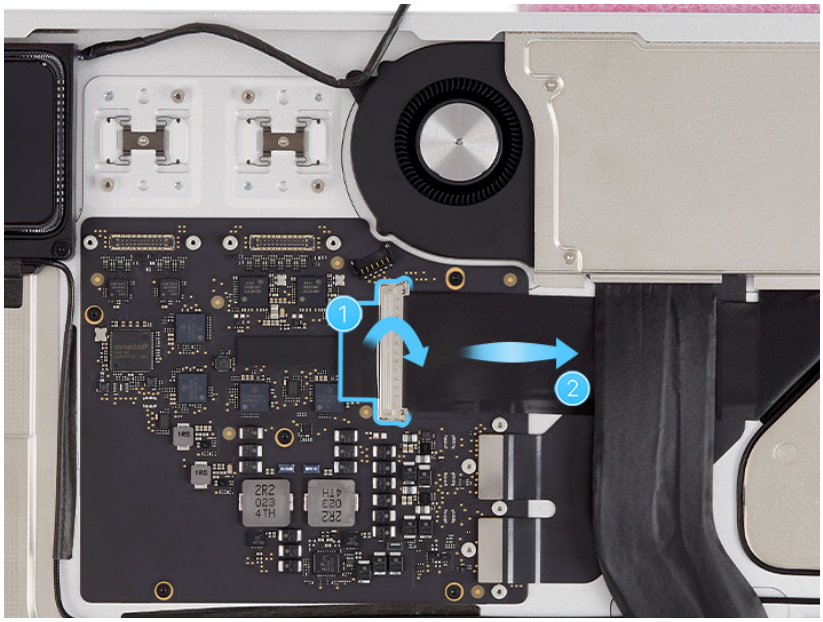
3. Remove the low-speed flex cable cowling and save it for reassembly.

4. Use the flat end of the black stick to lift both ends of the low-speed flex cable off the connectors.



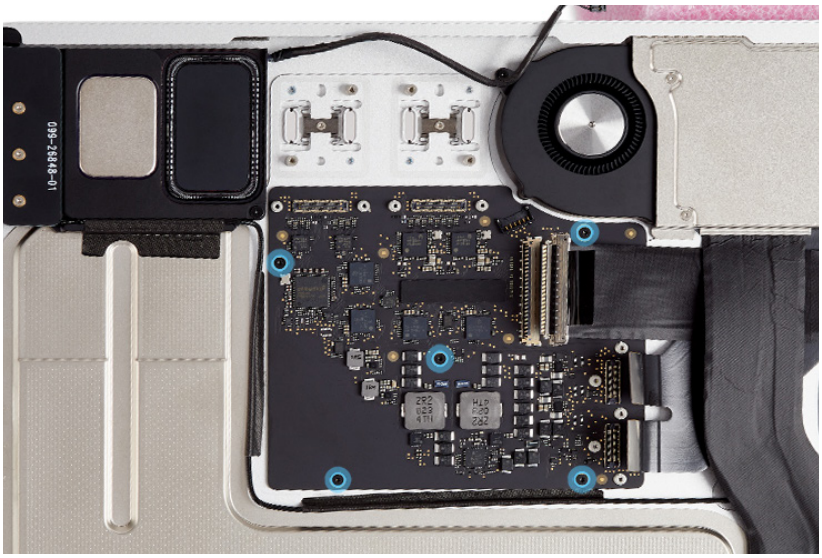
5. Pull the tab to flip up the locking bar on the high-speed flex cable (1).

6. Slide the end of the high-speed flex cable out of the connector (2).



© 2022 Apple Inc. All rights reserved.

7. Use the T3 screwdriver to remove the five T3 screws (923-05560) from the adapter board.

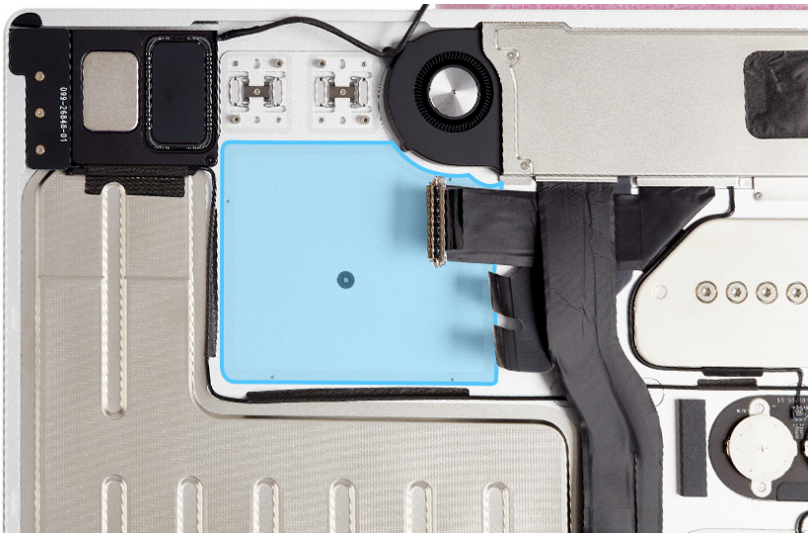


8. Place the flat end of the black stick between the adapter board and housing. Then use the flat end of the black stick to lift the adapter board out of the housing.

© 2022 Apple Inc. All rights reserved.

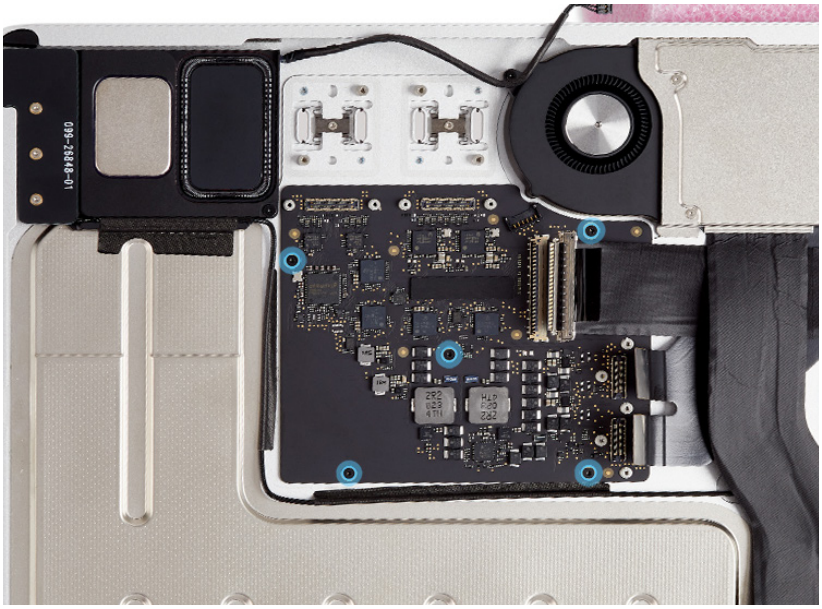
Reassembly

1. Position the adapter board in the housing.



2. Use the T3 screwdriver to partially reinstall the five T3 screws (923-05560) into the adapter board.

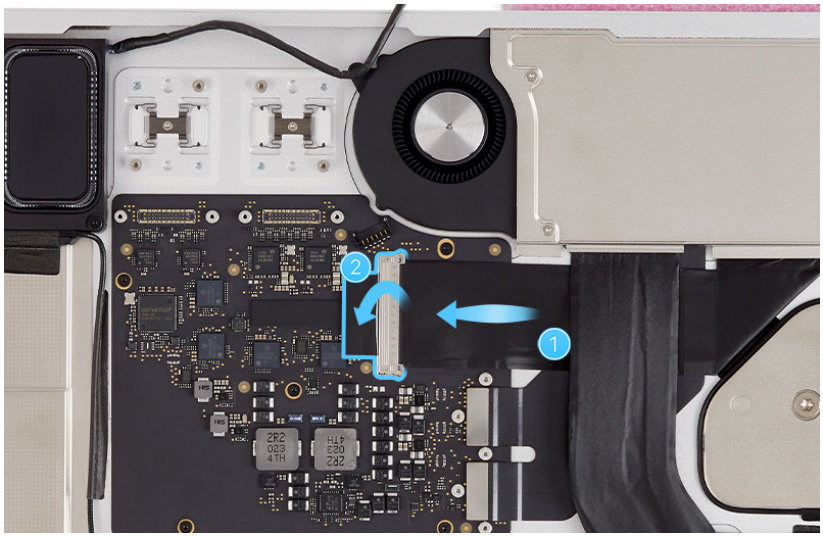
3. Once all five T3 screws are partially installed, use the T3 screwdriver to fully reinstall them into the adapter board.



© 2022 Apple Inc. All rights reserved.

4. Slide the end of the high-speed flex cable into the connector (1).

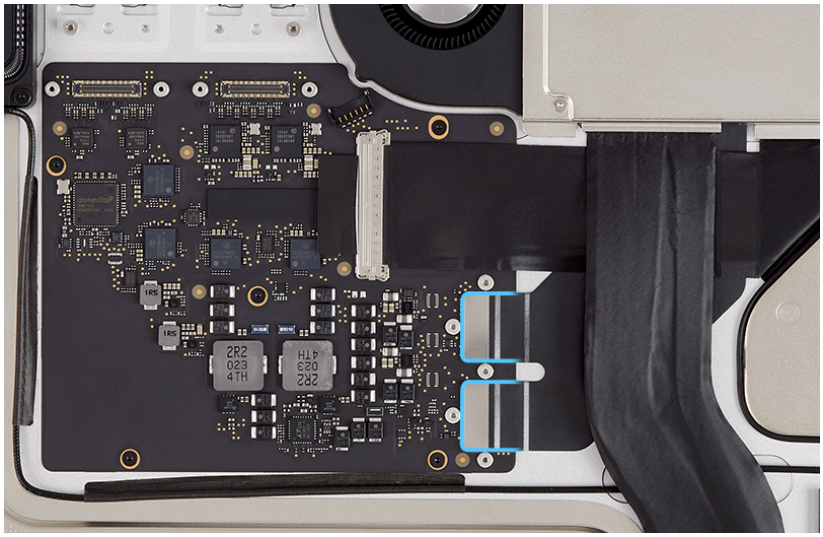
5. Flip down the locking bar on the high-speed flex cable (2).



6. Gently press both ends of the low-speed flex cable to the connectors on the adapter board.

Caution

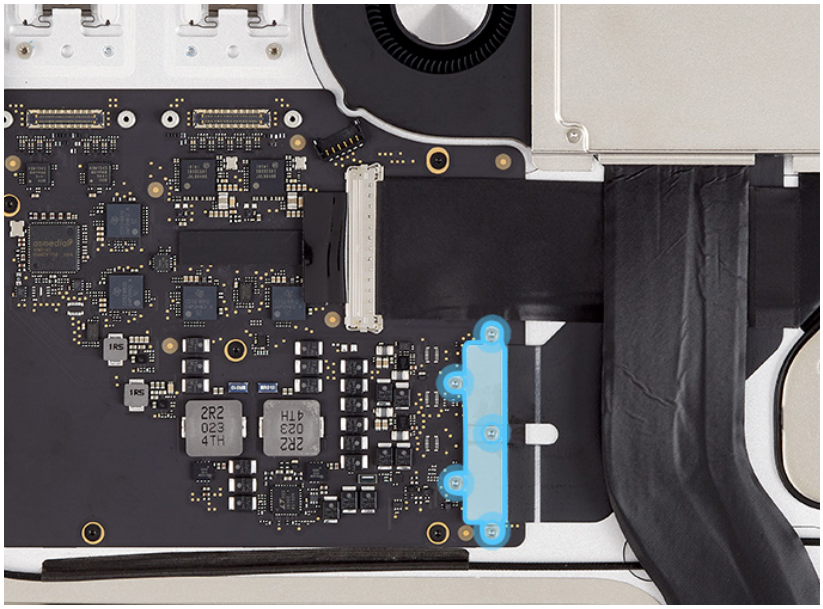
Don’t bend the connectors.



© 2022 Apple Inc. All rights reserved.

7. Position the low-speed flex cable cowling in the housing.

8. Use the T3 screwdriver to reinstall the five T3 screws (923-05559) into the low-speed flex cable cowling.



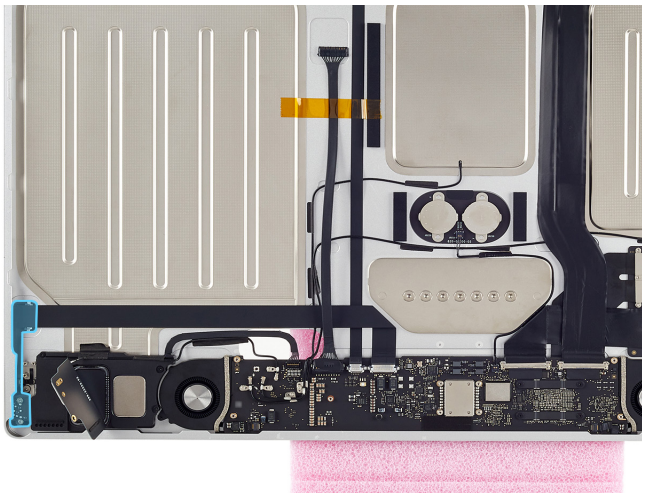
Reinstall the following parts to complete reassembly:

- USB-C boards
- Display

© 2022 Apple Inc. All rights reserved.

Audio Board

Before You Begin



Remove the following parts before you begin:

- Display
- Logic board cover

Tools

- 3.5 mm hex nut driver
- EarPods with 3.5 mm headphone plug
- ESD-safe tweezers
- Nylon probe (black stick)
- Support wedges
- Torx T3 screwdriver

Caution

The power button flex cable connects to the audio board. Damage to the power button flex cable requires a replacement housing.

© 2022 Apple Inc. All rights reserved.

Removal

1. Partially peel up the audio board flex cable (1) to access the connector near the edge of the housing.

2. Use the flat end of the black stick to press and hold the “PUSH” button on the audio board ZIF connector (2). Use ESD-safe tweezers to grasp the end of the flex cable and slide it out of the connector (3).



3. Use the T3 screwdriver to remove the upper three T3 screws (923-05574) and the lower T3 screw (923-05668) from the Wi-Fi and Bluetooth antenna.

 Note: The lower screw has a larger head than the upper three screws.



© 2022 Apple Inc. All rights reserved.

4. Gently move aside the Wi-Fi and Bluetooth antenna to access the power button flex cable underneath.

5. Flip up the locking lever of the power button flex cable connector. Then use ESD-safe tweezers to slide the end of the power button flex cable out of the connector on the audio board.



Caution

The power button flex cable is a nonremovable part. If the flex cable is damaged, you must replace the housing.

6. Use the T3 screwdriver to remove the upper T3 screw (923-05670) and the lower T3 screw (923-05669) from the audio board.



© 2022 Apple Inc. All rights reserved.

7. Use the 3.5 mm hex nut driver to remove the 3.5 mm hex nut screw (923-05671) from the audio board.



8. Insert the flat end of the black stick under the audio board to loosen the adhesive in the areas shown (1,2). Then use ESD-safe tweezers to gently peel up the audio board and remove it from the housing.



© 2022 Apple Inc. All rights reserved.

Reassembly

1. Align the screw holes in the audio board with the screw holes in the housing.



2. Use the T3 screwdriver to partially install the upper T3 screw (923-05670) and the lower T3 screw (923-05669) into the audio board.



© 2022 Apple Inc. All rights reserved.

3. Use the 3.5 mm hex nut driver to partially reinstall the 3.5 mm hex nut screw (923-05671).



4. Plug the EarPods into the 3.5 mm headphone jack to ensure audio board alignment. Adjust the alignment of the audio board until the plug is easy to insert and remove.



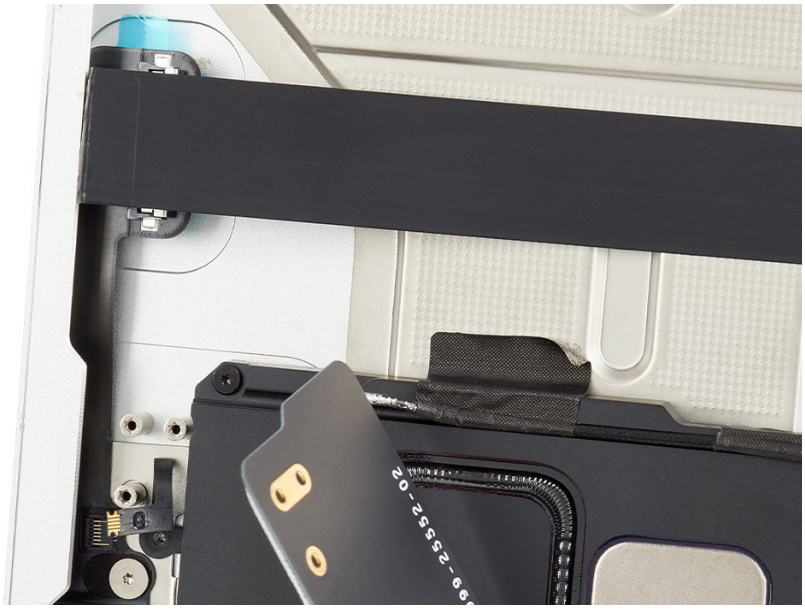
5. Use the T3 screwdriver nut to fully tighten the two T3 screws. Then use the 3.5 mm hex nut driver to fully reinstall the 3.5 mm hex nut screw.

6. Unplug the EarPods.

© 2022 Apple Inc. All rights reserved.

7. Readhere the top portion of the audio board to the housing.

 Note: If installing a replacement part, remove the adhesive backing from the top portion of the audio board, then adhere it to the housing.



8. Slide the end of the audio board flex cable into the ZIF connector.

> **Caution**
>
> Ensure that the audio board flex cable is fully inserted into the ZIF connector. A partially connected flex cable may prevent the computer from turning on.



© 2022 Apple Inc. All rights reserved.

9. Slide the end of the power button cable into the audio board. Then flip down the locking lever.



10. Position the Wi-Fi and Bluetooth antenna in the housing.

11. Use the T3 screwdriver to reinstall the upper three T3 screws (923-05574) and the lower T3 screw (923-05668) into the Wi-Fi and Bluetooth antenna.

Important

Reinstall the T3 screw with the larger head into the bottom screw hole on the Wi-Fi and Bluetooth antenna.



Reinstall the following parts to complete reassembly:

- Logic board cover
- Display

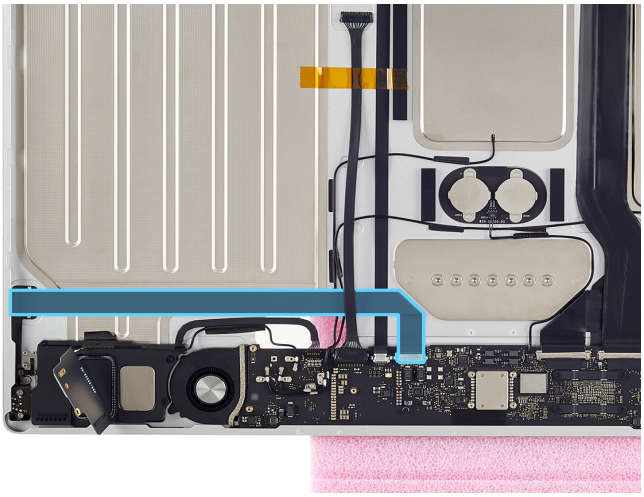
© 2022 Apple Inc. All rights reserved.

Audio Board Flex Cable

Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover



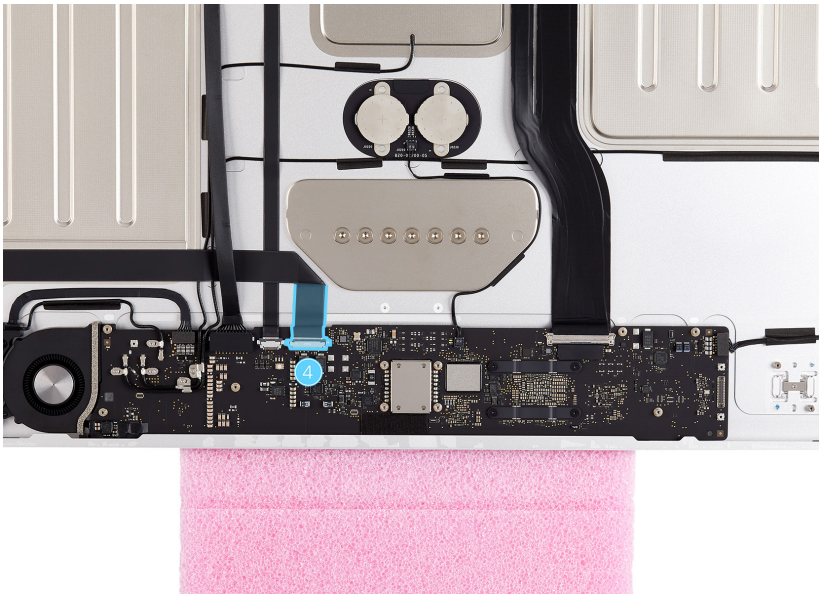
Tools

- ESD-safe tweezers
- Nylon probe (black stick)
- Support wedges

© 2022 Apple Inc. All rights reserved.

Removal

1. Use the flat end of the black stick to press and hold the “PUSH” button on the audio board flex cable ZIF connector on the logic board. Then slide the end of the audio board flex cable out of the connector.



2. Peel up the audio board flex cable from the housing (1) to access the ZIF connector near the edge of the housing.

3. Use the flat end of the black stick to press and hold the “PUSH” button on the audio board ZIF connector (2) on the housing. Use ESD-safe tweezers to grasp the end of the flex cable and slide it out of the connector (3).



© 2022 Apple Inc. All rights reserved.

Reassembly

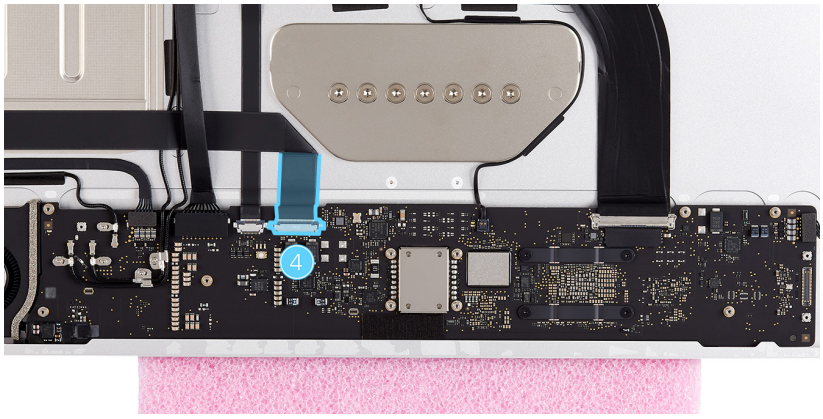
1. Position the replacement audio board flex cable in the housing.

2. Use the flat end of the black stick to press and hold the “PUSH” button on the audio board flex cable ZIF connector on the housing. Then use ESD-safe tweezers to slide the end of the flex cable into the connector.

3. Use the flat end of the black stick to press the “PUSH” button on the audio board flex cable ZIF connector on the logic board. Then slide the end of the flex cable into the connector.



4. Remove the adhesive backing from the audio board flex cable. Then press along the length of the audio board flex cable to adhere it to the housing.



Reinstall the following parts to complete reassembly:

- Logic board cover
- Display

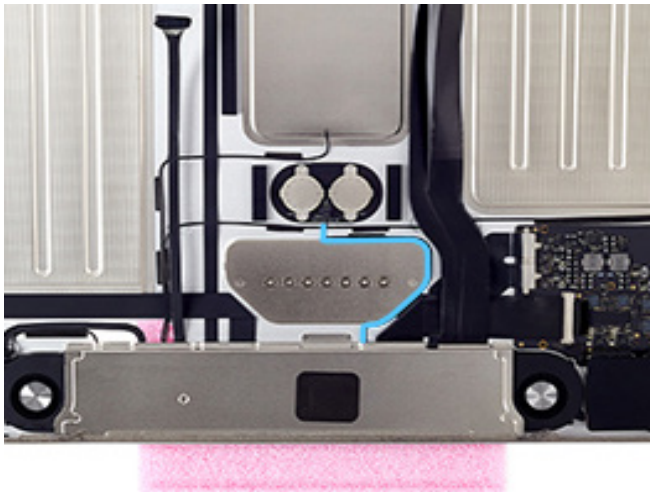
© 2022 Apple Inc. All rights reserved.

Battery Board Cable

Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover



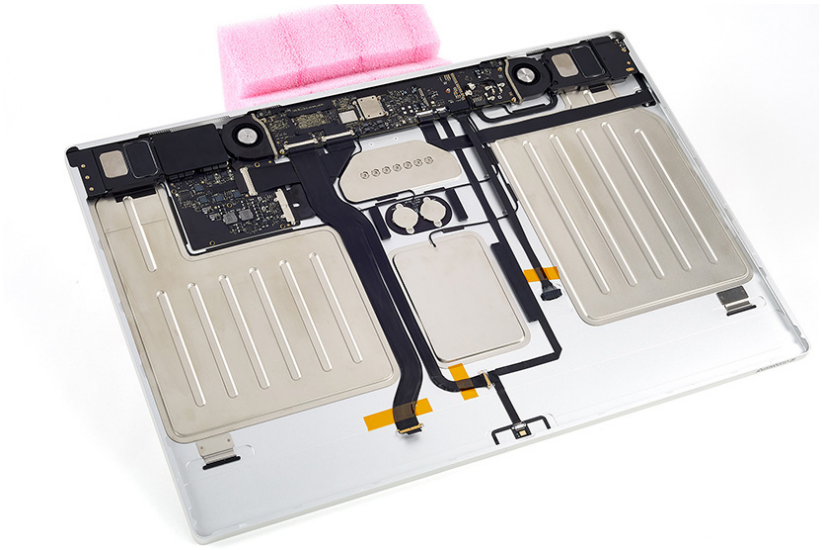
Tools

- Nylon probe (black stick)
- Support wedges

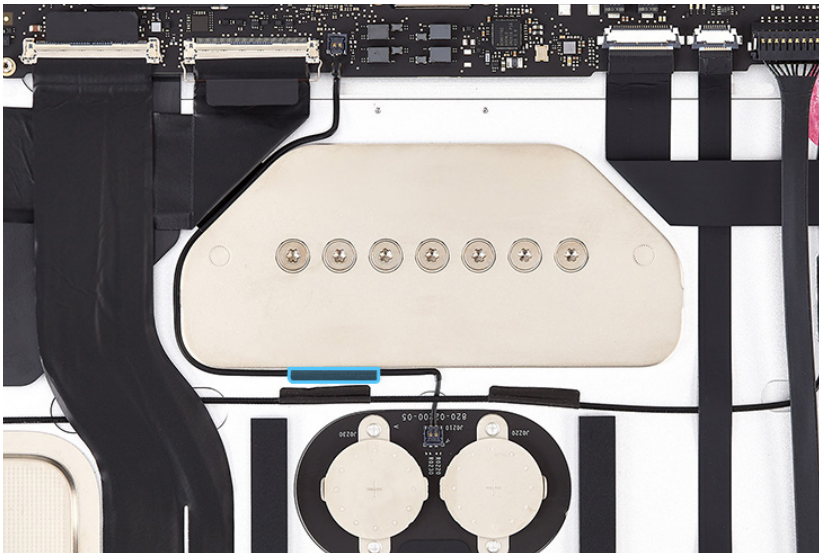
© 2022 Apple Inc. All rights reserved.

Removal

1. Position the housing with the back facedown and the top closest to you.



2. Gently peel up the polyester film tape attached to the housing in the area shown. Don’t remove the tape from the battery board cable. Remove the cable from the housing.



© 2022 Apple Inc. All rights reserved.

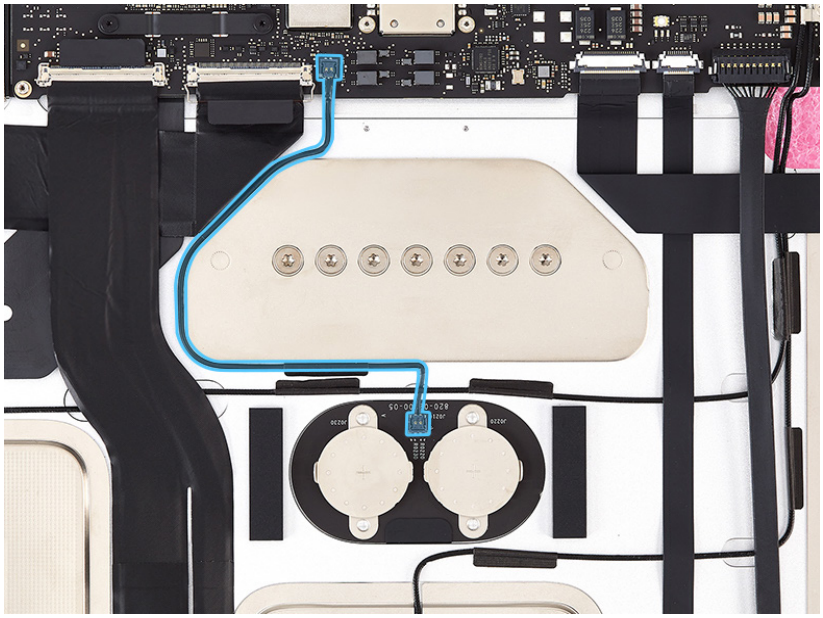
3. Use the black stick to lift the end of the battery board cable off the connector on the logic board. Then lift the other end of the battery board cable off the connector on the battery board.



© 2022 Apple Inc. All rights reserved.

Reassembly

1. Position the battery board cable in the housing as shown. Press one end of the battery board cable to the connector on the logic board (1). Then press the other end of the cable to the battery board (2).



2. Adhere the polyester film tape to the battery board cable and housing as shown.



Important

If you're installing a replacement battery board cable, peel the adhesive backing off the tape before you adhere it to the housing.

Reinstall the following parts to complete reassembly:

- Logic board cover
- Display

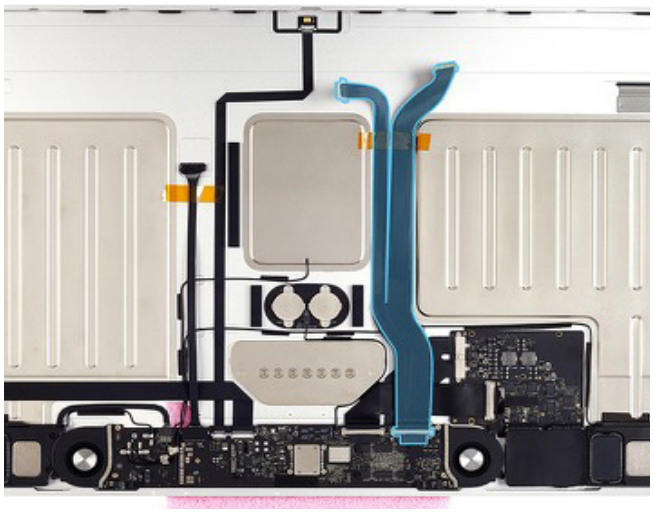
© 2022 Apple Inc. All rights reserved.

Camera and Embedded DisplayPort Flex Cable

Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover



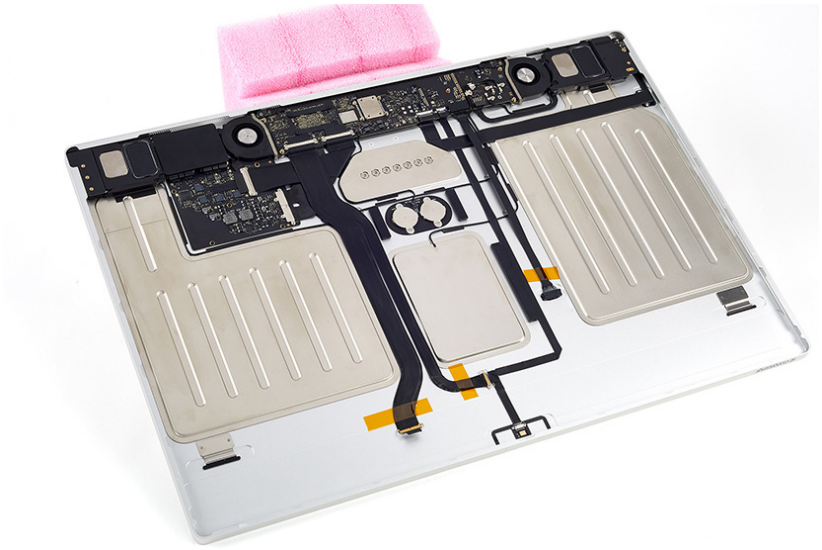
Tools

- Nylon probe (black stick)
- Support wedges

© 2022 Apple Inc. All rights reserved.

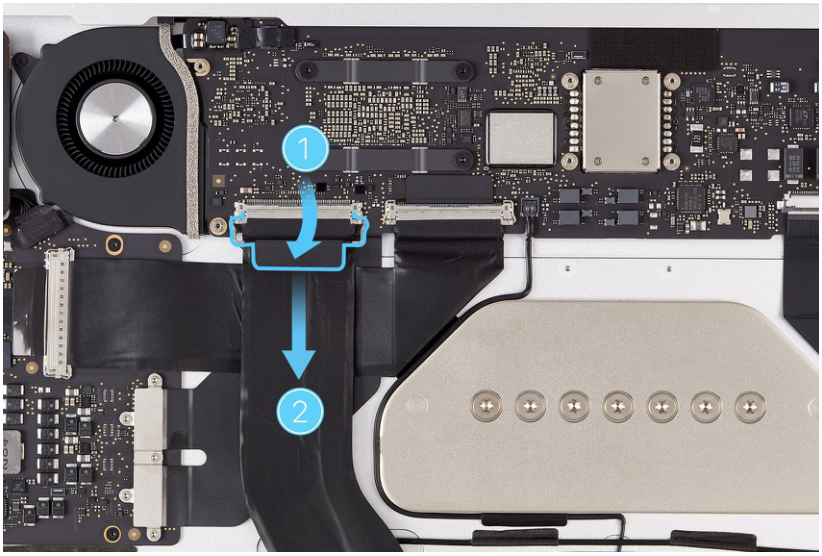
Removal

1. Position the housing with the back facedown and the top closest to you.



2. Pull the tab to flip up the locking bar on the camera and embedded DisplayPort (eDP) flex cable (1).

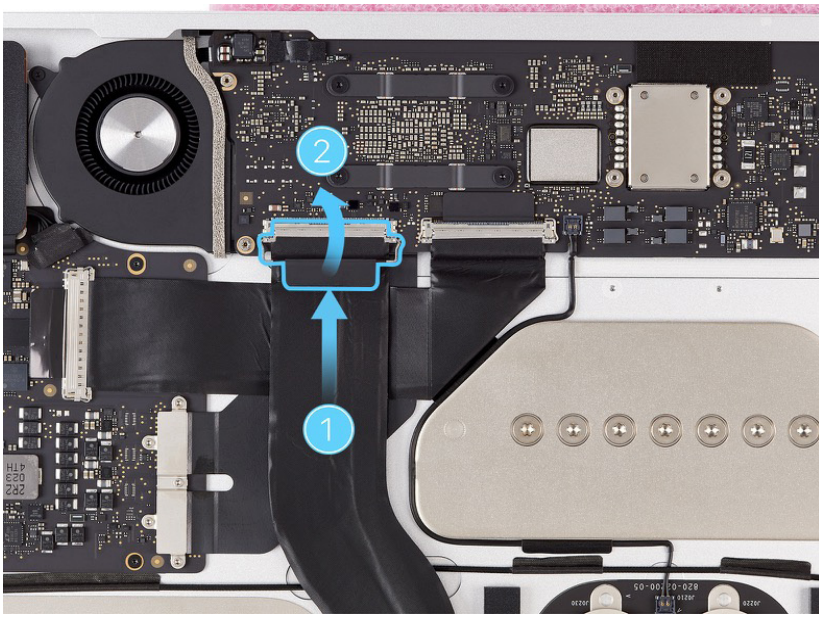
3. Slide the end of the camera and eDP flex cable straight out of the connector to remove it from the housing (2).



© 2022 Apple Inc. All rights reserved.

Reassembly

1. Slide the end of the camera and eDP flex cable into the connector (1). Then flip down the locking bar (2).



Reinstall the following parts to complete reassembly:

- Logic board cover
- Display

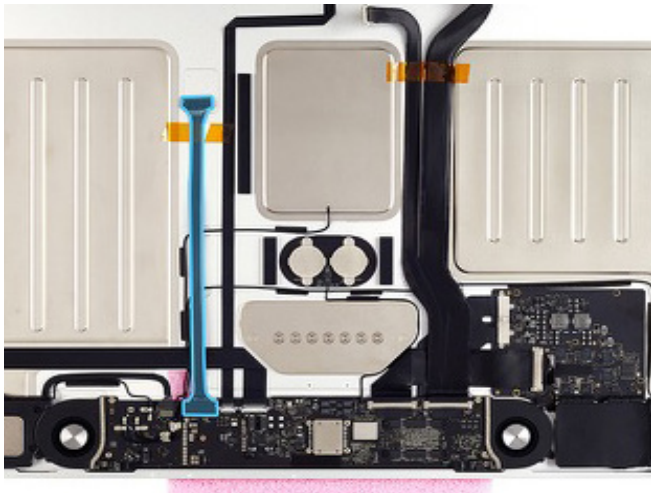
© 2022 Apple Inc. All rights reserved.

Display Backlight Flex Cable

Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover
- Camera and embedded DisplayPort flex cable



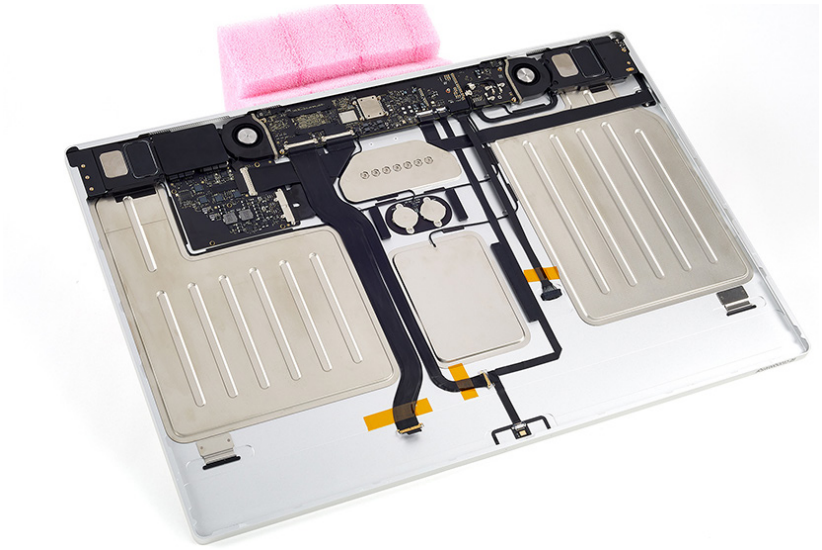
Tools

- Nylon probe (black stick)
- Support wedges

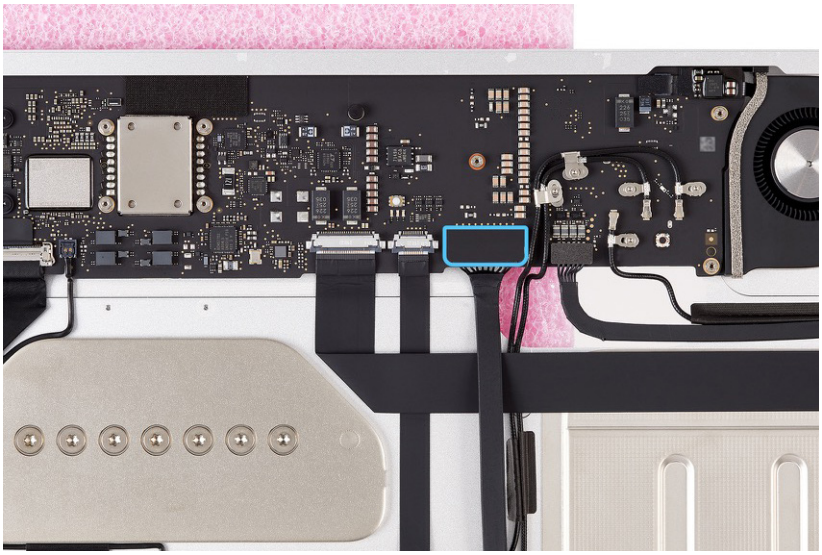
© 2022 Apple Inc. All rights reserved.

Removal

1. Position the housing with the back facedown and the top closest to you.

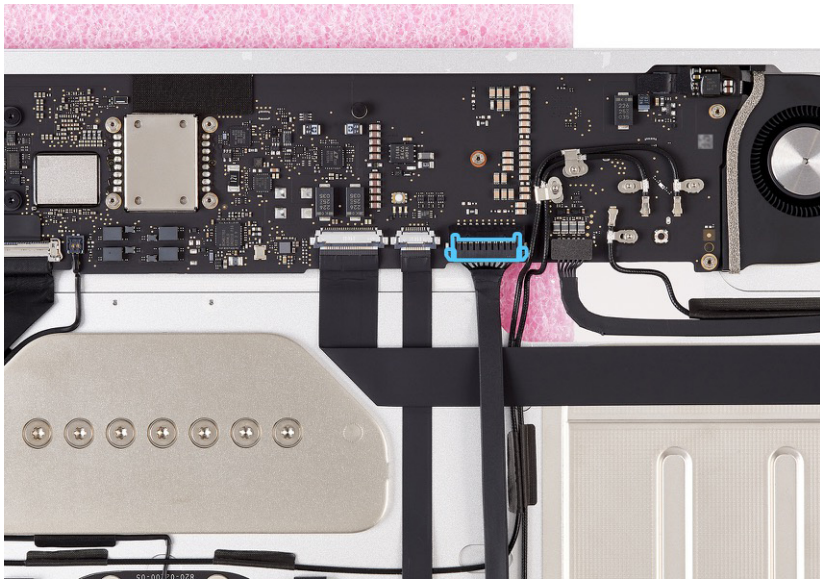


2. Peel off the polyester film tape from the end of the display backlight flex cable. Save the polyester film tape for reassembly.



© 2022 Apple Inc. All rights reserved.

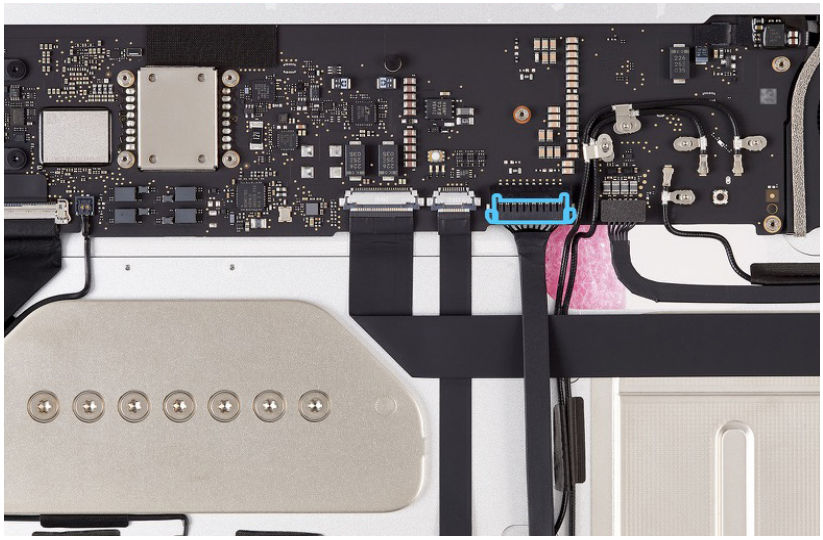
3. Squeeze both sides of the end of the display backlight flex cable and pull it straight out of the connector.



© 2022 Apple Inc. All rights reserved.

Reassembly

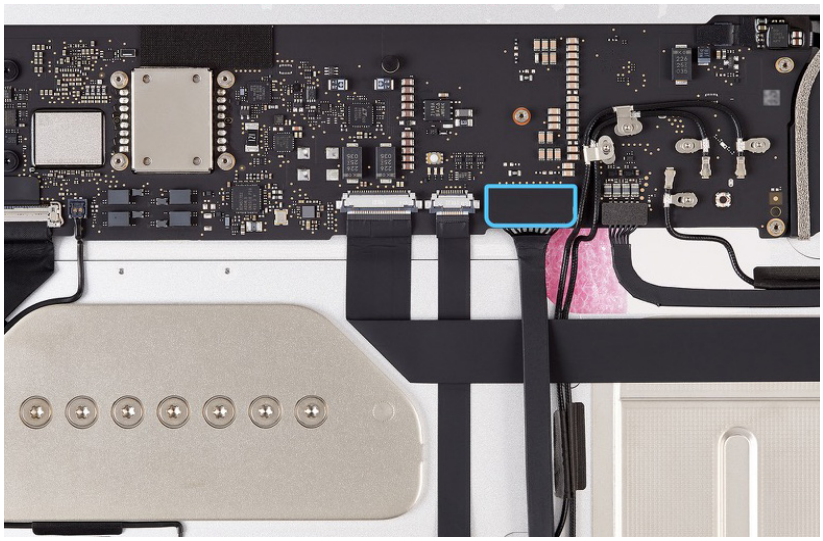
1. Slide the end of the display backlight flex cable into the connector.



2. Reinstall the polyester film tape onto the display backlight flex cable connector.

Important

Install new polyester film tape whenever it's provided with a replacement part.



Reinstall the following parts to complete reassembly:

- Logic board cover
- Display

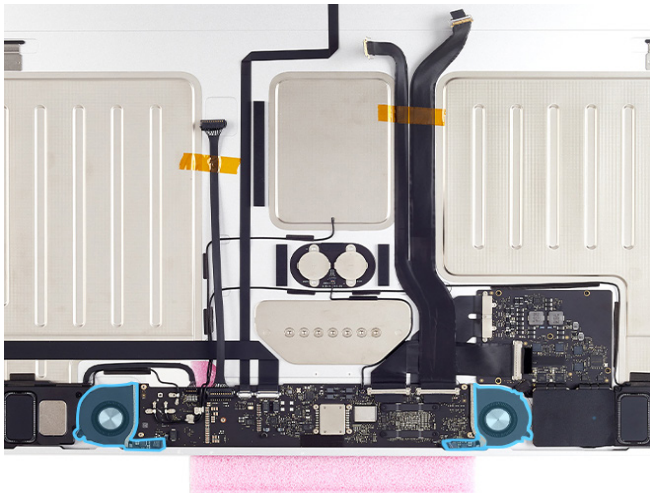
© 2022 Apple Inc. All rights reserved.

Fans

Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover



Tools

- 2.5 mm hex nut driver
- Nylon probe (black stick)
- Support wedges
- Torx T3 screwdriver

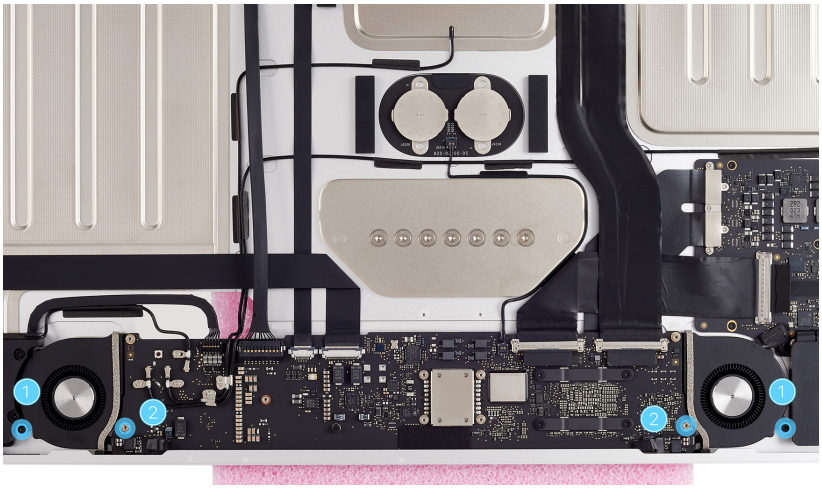
Important

You must replace the fans in pairs.

© 2022 Apple Inc. All rights reserved.

Removal

1. Use the T3 screwdriver to remove the two T3 screws (923-05558) (1) from each of the fans.



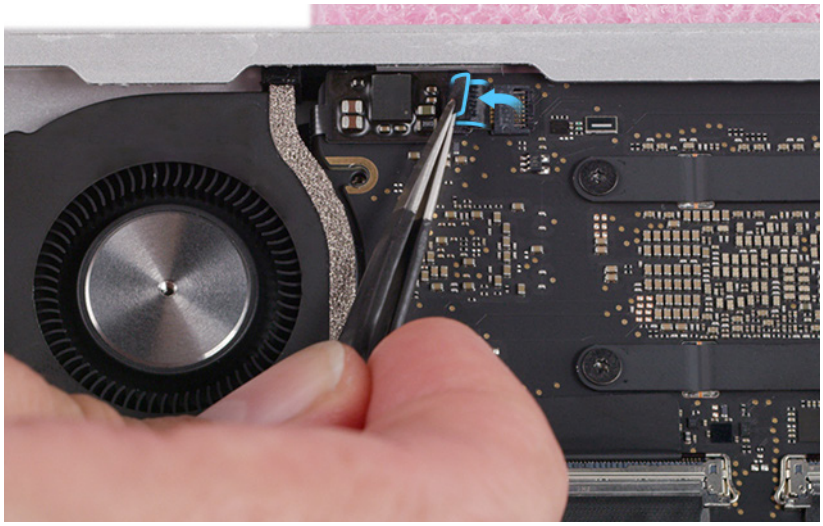
2. Use the 2.5 mm hex nut driver to remove the two 2.5 mm hex nut screws (923-05573) (2) from the logic board.

3. Position the housing with the back facedown and the top closest to you.

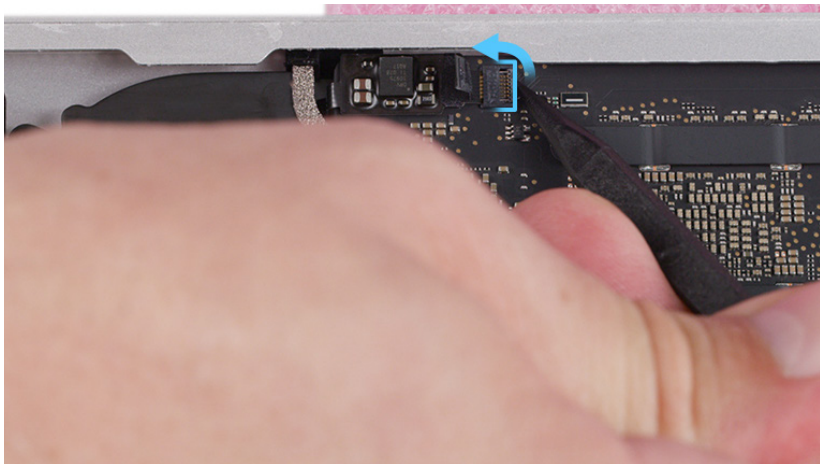


© 2022 Apple Inc. All rights reserved.

4. Use ESD-safe tweezers to peel back the polyester film tab from the fan cable connector.



5. Use the black stick to flip up the locking lever on the fan cable connector.



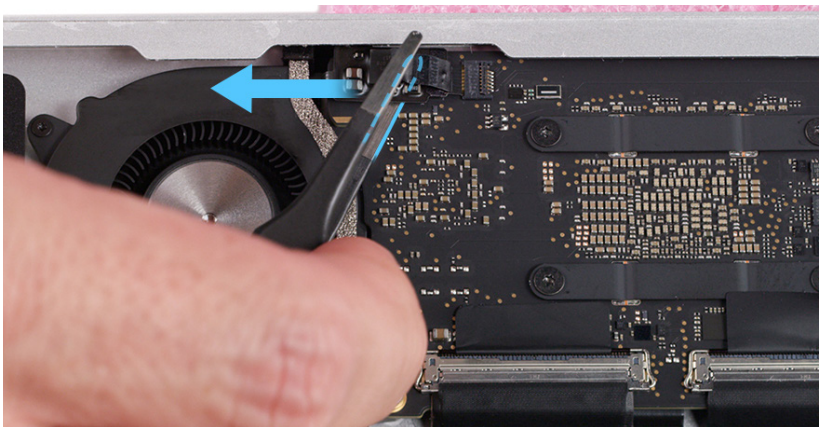
6. Spread the tips of the ESD-safe tweezers and insert one tip under the fan cable. Then gently slide the tip of the ESD-safe tweezers toward the fan under the fan cable to loosen the adhesive between the fan cable and logic board.

Caution

- Keep the tweezers parallel with the logic board surface to prevent damage.
- Don't touch any of the small components on the logic board.

© 2022 Apple Inc. All rights reserved.

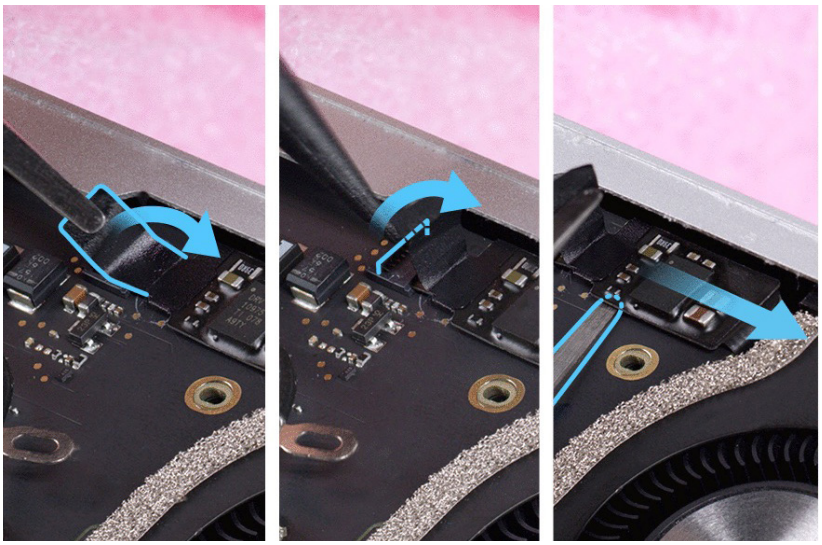
7. Use the black stick to support the fan cable. Then gently slide the end of the fan cable out of the connector.



Caution

Don't bend or twist the fan cable.

8. Repeat steps 1 through 7 on the other side of the logic board to remove the other fan cable.

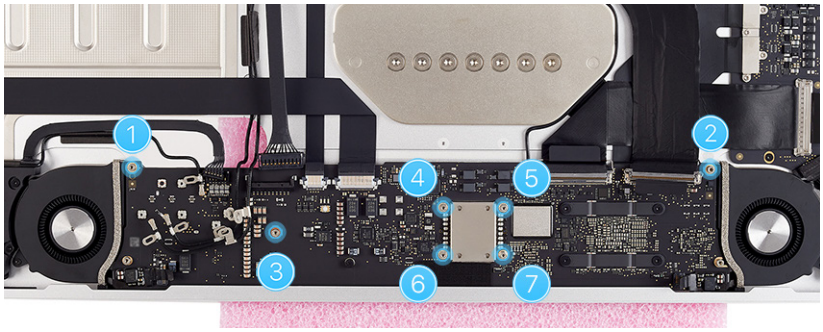


9. Place the computer upright.

© 2022 Apple Inc. All rights reserved.

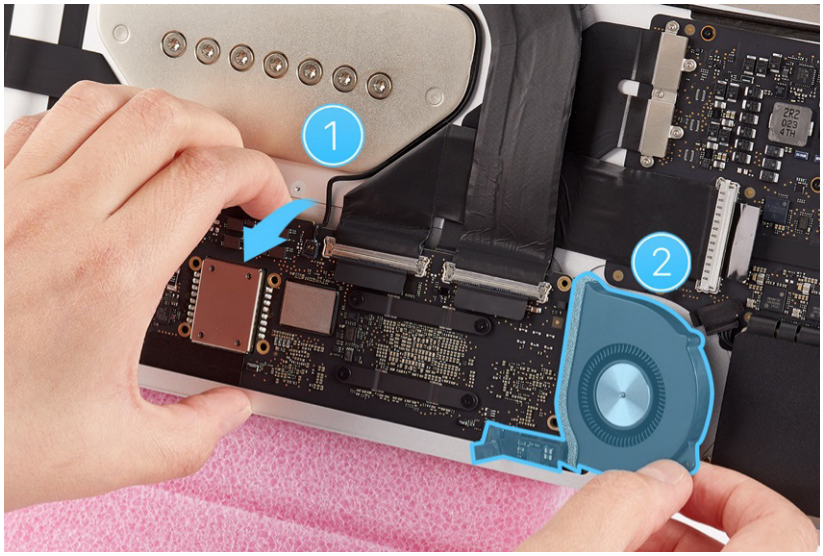
10. Use the 2.5 mm hex nut driver to remove the seven 2.5 mm hex nut screws from the logic board.
 - (923-05573) (1–3)
 - (923-05556) (4–7)

 Note: If repairing a housing with a VESA mount adapter, keep the computer flat in the VESA support wedge. Then rotate the computer so the logic board is closest to you.



11. Tilt up the logic board (1). Then slide the right fan out from under the logic board (2).

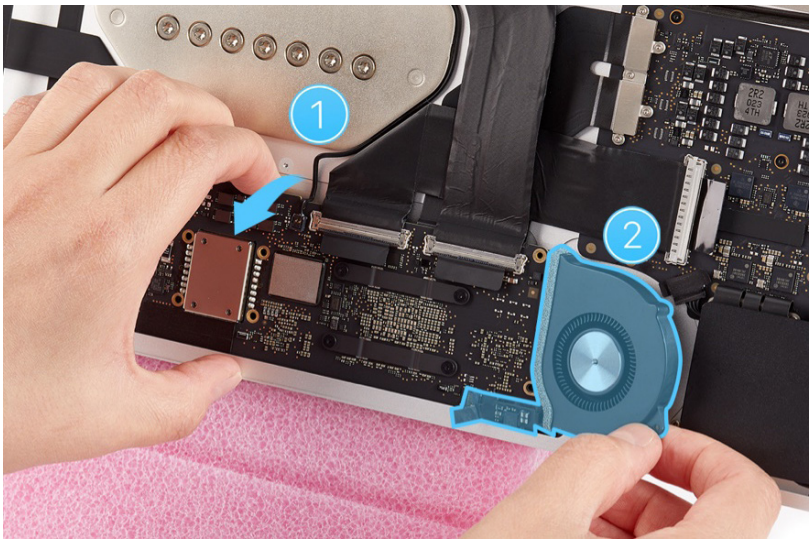
12. With the logic board still tilted up (1), slide the left fan out from under the logic board (2).



© 2022 Apple Inc. All rights reserved.

Reassembly

1. Tilt up the logic board (1). Then slide the right fan into place under the logic board (2).



2. With the logic board still tilted up, slide the left fan into place under the logic board.

 Note: Ensure that the screw holes in the fan and logic board align with the screw holes in the housing.

3. Position the housing with the back facedown and the top closest to you.



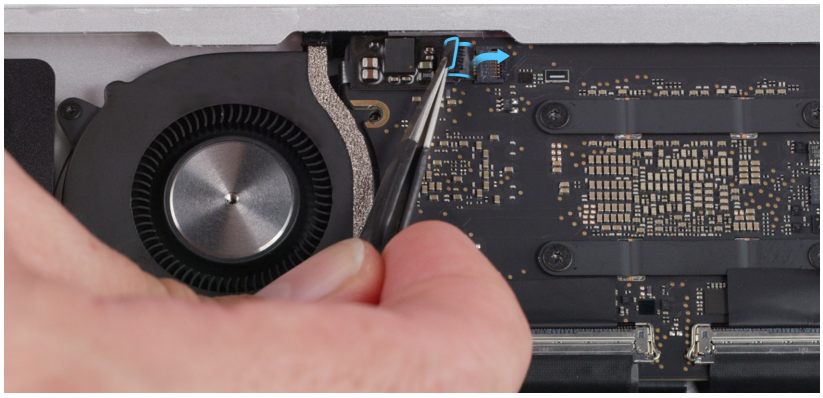
© 2022 Apple Inc. All rights reserved.

4. Slide the end of the fan cable into the fan cable connector. Then flip down the locking lever.

5. Press the polyester film tab to the fan cable connector.

6. Press the fan cable to adhere it to the logic board.

7. Repeat steps 4 through 6 to reinstall the other fan.

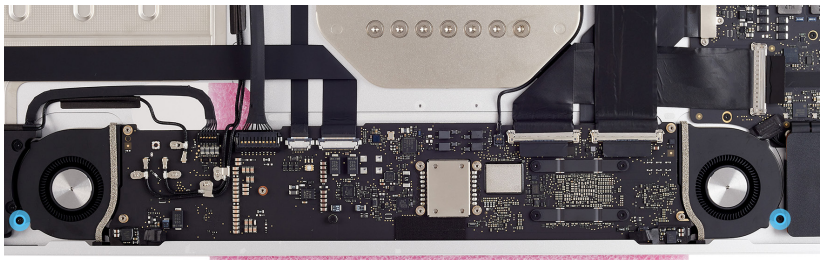


Important

If installing new fans, slide the ends of the fan cables into the connectors on the logic board. Then remove the release liners from the fan cables before pressing the fan cables to adhere them to the logic board.

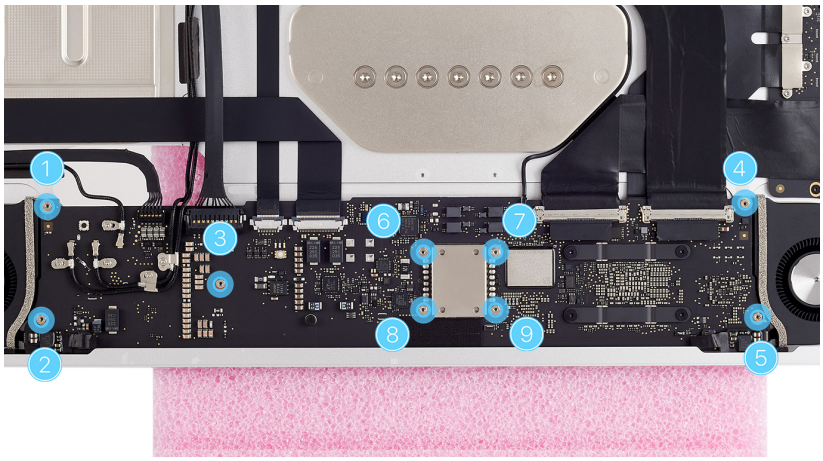
8. Rotate the computer so the logic board is closest to you.

9. Use the T3 screwdriver to reinstall the two T3 screws (923-05558) into each of the fans.



© 2022 Apple Inc. All rights reserved.

10. Use the 2.5 mm hex nut driver to reinstall the nine 2.5 mm hex nut screws into the logic board.
 - (923-05573) (1–5)
 - (923-05556) (6–9)



Reinstall the following parts to complete reassembly:

- Logic board cover
- Display

© 2022 Apple Inc. All rights reserved.

High-Speed Flex Cable

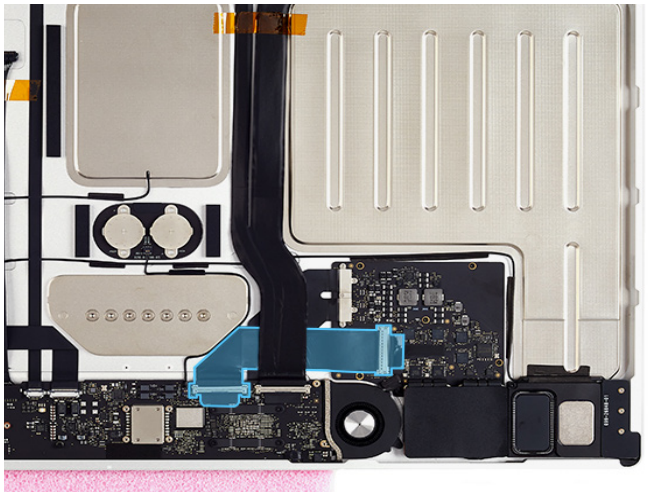
Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover
- Camera and Embedded DisplayPort Flex Cable

Tools

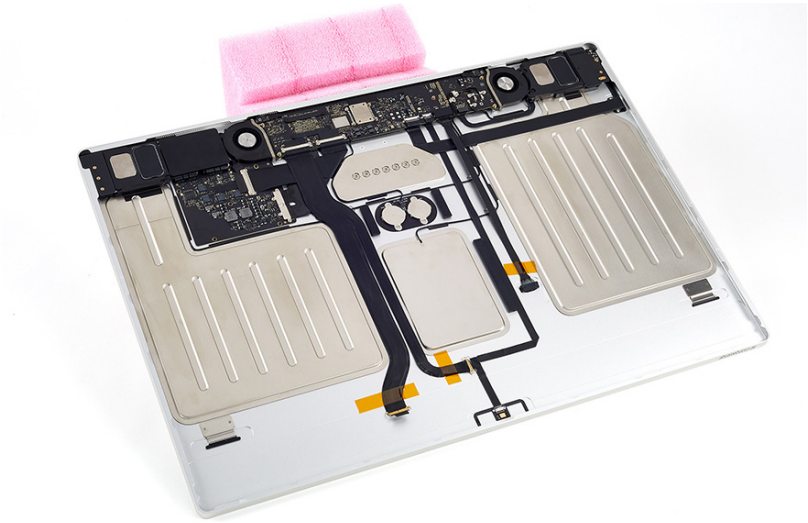
- Nylon probe (black stick)
- Support wedges



© 2022 Apple Inc. All rights reserved.

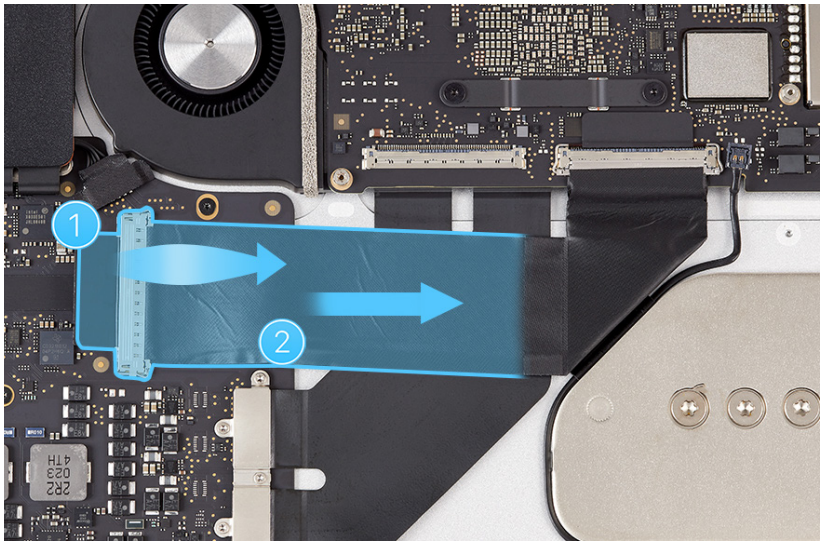
Removal

1. Position the housing with the back facedown and the top closest to you.



2. Pull the tab to flip up the locking bar on the high-speed flex cable (1).

3. Slide the end of the high-speed flex cable out of the connector on the adapter board (2).

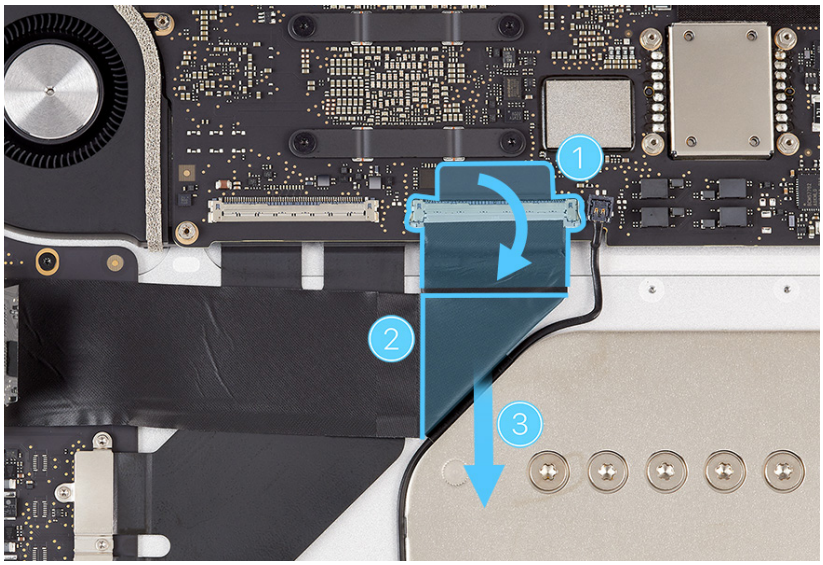


© 2022 Apple Inc. All rights reserved.

4. Pull the tab to flip up the locking bar on the high-speed flex cable (1).

5. Insert the flat end of the black stick under the high-speed flex cable to loosen the adhesive between the flex cable and housing (2).

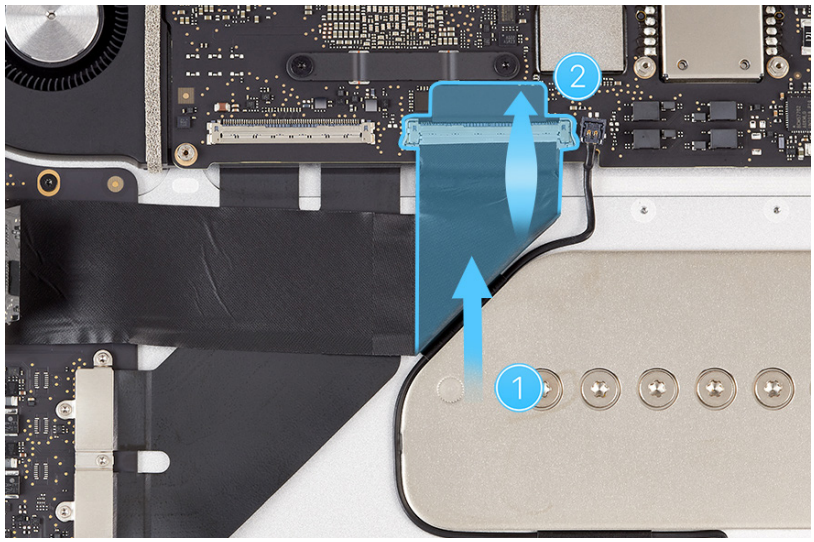
6. Slide the end of the high-speed flex cable out of the connector on the logic board (3).



© 2022 Apple Inc. All rights reserved.

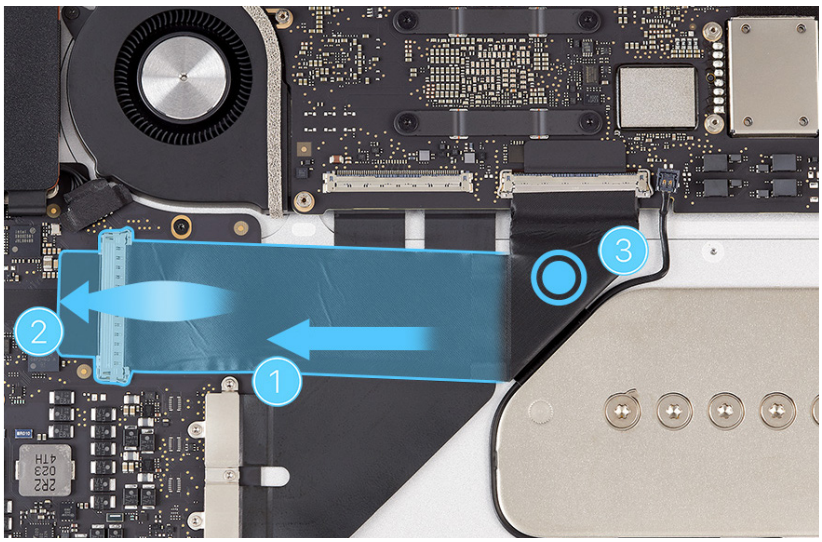
Reassembly

1. Insert the logic board end of the high-speed flex cable into the connector on the logic board (1).
2. Flip down the locking bar on the high-speed flex cable (2).



3. Insert the adapter board end of the high-speed flex cable into the connector on the adapter board (1).
4. Flip down the locking bar on the high speed flex cable (2). Then press the folded corner of the flex cable to adhere it to the housing (3).

 Note: If you're installing a replacement high-speed flex cable, remove the adhesive backing from the flex cable (3). Then press the folded corner of the flex cable to adhere it to the housing.



Reinstall the following parts to complete reassembly:

- Camera and embedded DisplayPort flex cable
- Logic board cover
- Display

© 2022 Apple Inc. All rights reserved.

Logic Board

Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover



Tools

- 2.5 mm hex nut driver
- Antenna tool
- Nylon probe (black stick)
- Support wedges
- Torx T3 screwdriver

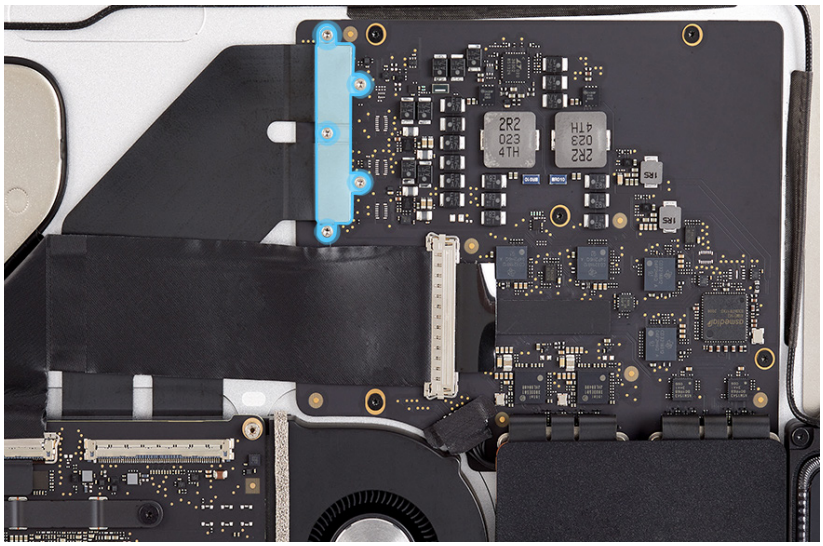
Caution

This procedure requires System Configuration. After you've completed all removal and reassembly steps, learn how to initiate the System Configuration process at https://support.apple.com/self-service-repair/.

© 2022 Apple Inc. All rights reserved.

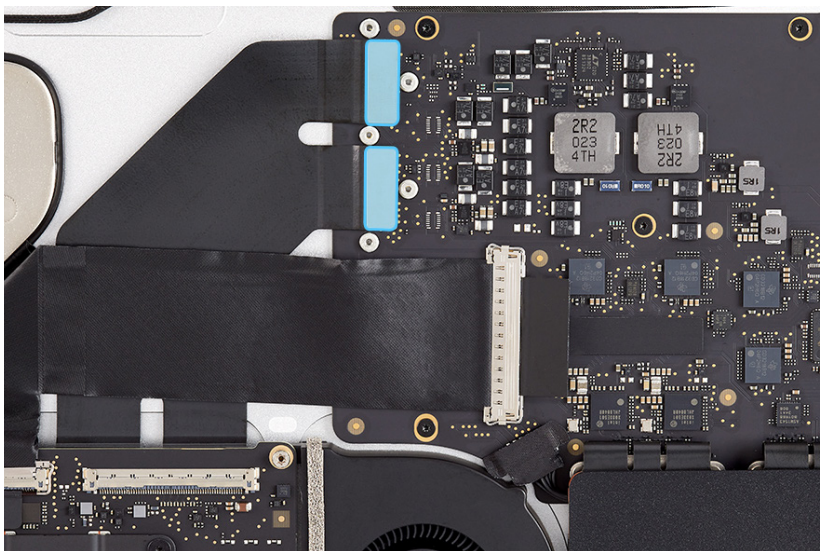
Removal

1. Use the T3 screwdriver to remove the five T3 screws (923-05559) from the low-speed flex cable cowling on the adapter board.



2. Remove the low-speed flex cable cowling and save it for reassembly.

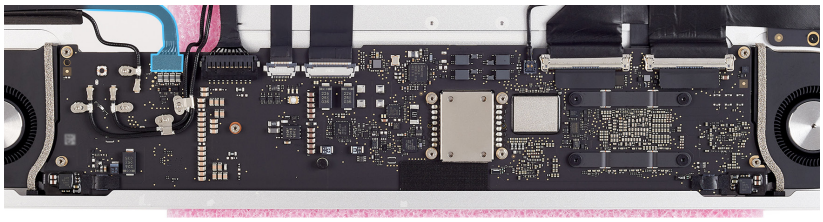
3. Use the flat end of the black stick to lift both ends of the low-speed flex cable off the connectors on the adapter board.



© 2022 Apple Inc. All rights reserved.

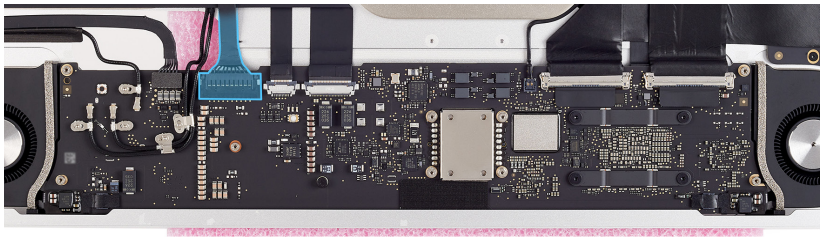
4. Peel off the foam pad from the speaker cable connector. Save the foam pad for reassembly.

5. Use the flat end of the black stick to lift the end of the speaker cable off the connector.

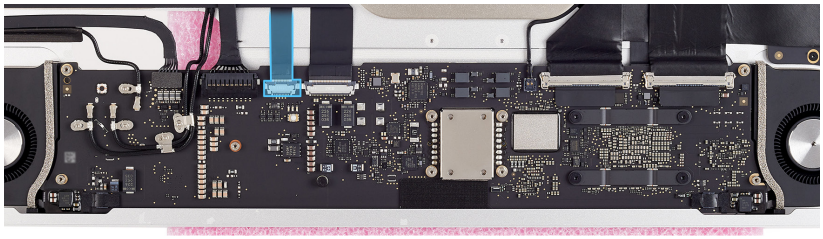


6. Peel off the polyester film tape from the display backlight cable connector. Save it for reassembly.

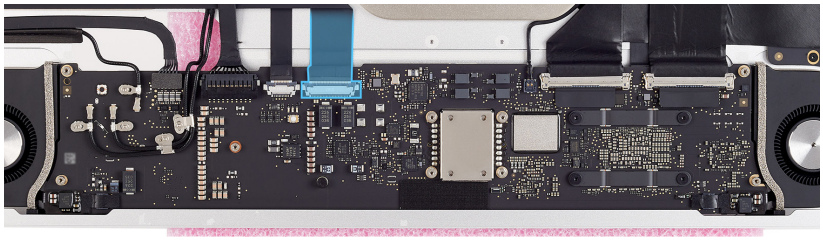
7. Pinch the sides of the end of the display backlight flex cable and slide it out of the connector.



8. Use the flat end of the black stick to press and hold the “PUSH” button on the zero-insertion force (ZIF) microphone flex cable connector. Then, slide the end of the microphone flex cable out of the connector.

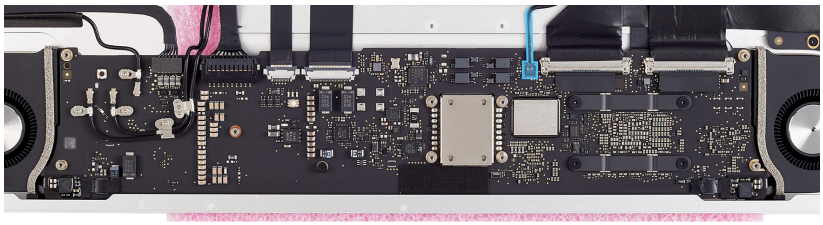


9. Use the flat end of the black stick to press and hold the “PUSH” button on the ZIF audio board and power button cable connector. Then slide the end of the audio board and power button cable out of the connector.



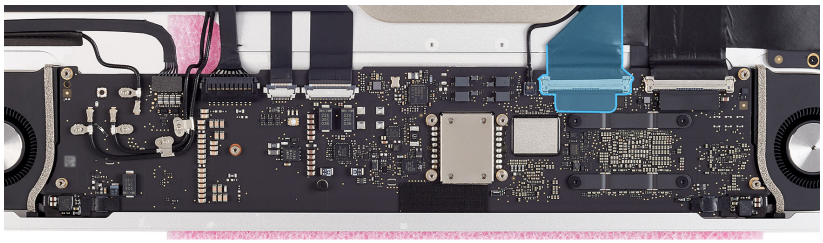
© 2022 Apple Inc. All rights reserved.

10. Use the black stick to support the battery board cable. Then gently lift the end of the battery board cable off the connector.



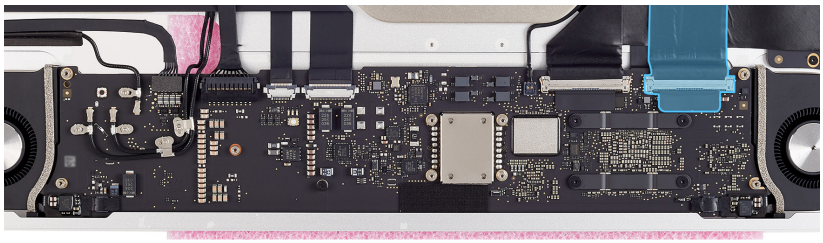
11. Pull the tab to flip up the locking bar on the high-speed flex cable.

12. Slide the end of the high-speed flex cable out of the connector.

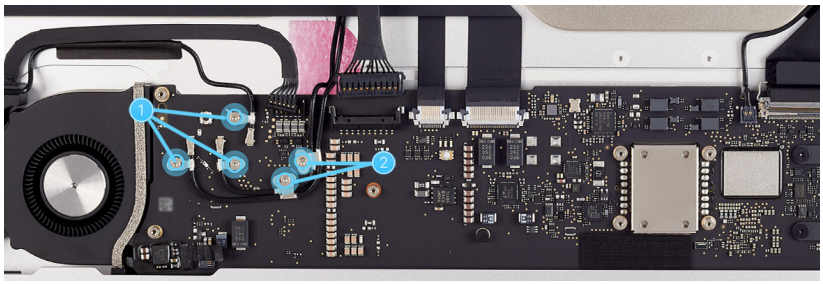


13. Pull the tab to flip up the locking bar on the camera and eDP flex cable.

14. Slide the end of the camera and eDP flex cable out of the connector.

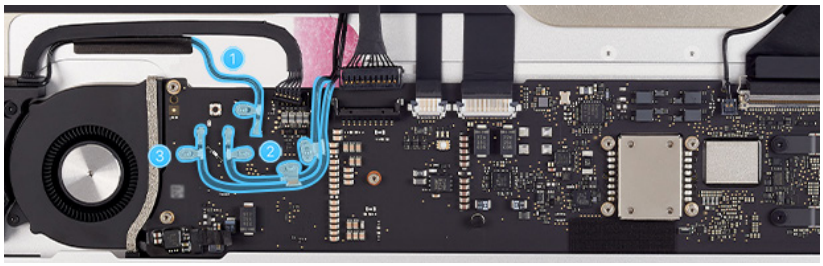


15. Use the T3 screwdriver to remove the five T3 screws from the antenna grounding clips.
 - (923-05174) (1)
 - (923-05173) (2)

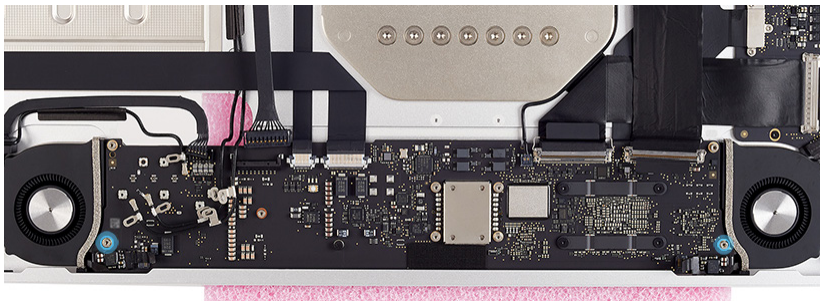


© 2022 Apple Inc. All rights reserved.

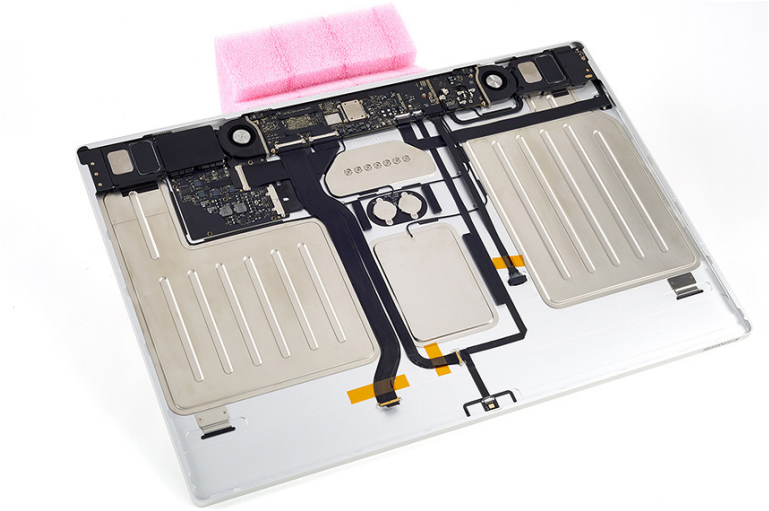
16. Use the antenna tool to lift the ends of the three antenna coaxial cables off the connectors.



17. Use the 2.5 mm hex nut driver to remove the two 2.5 mm hex nut screws (923-05573) near each of the fan cables.

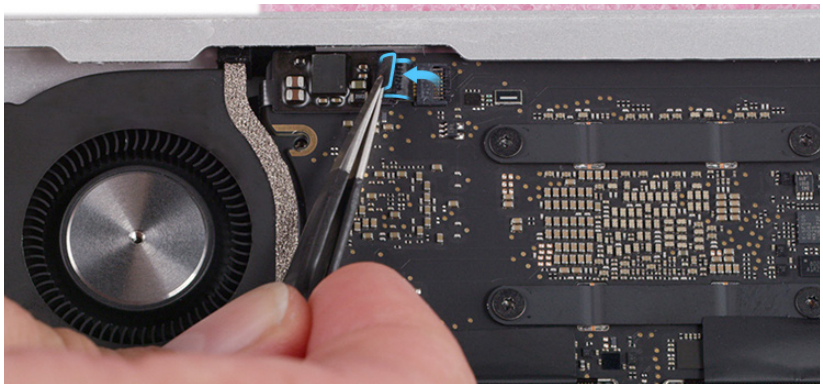


18. Position the housing with the back facedown and the top closest to you.



© 2022 Apple Inc. All rights reserved.

19. Use ESD-safe tweezers to peel back the polyester film tab on the fan cable connector.



20. Use the flat end of the black stick to flip up the locking lever on the fan cable connector.



21. Spread the tips of the ESD-safe tweezers and insert one tip under the fan cable. Carefully slide the ESD-safe tweezers toward the fan to loosen the adhesive between the fan cable and logic board.

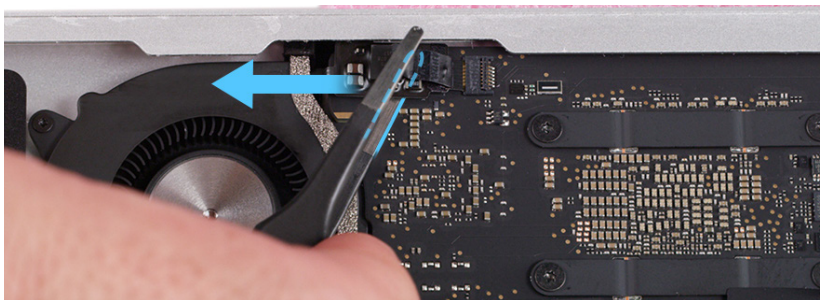
Important

- Don't touch any of the small components on the logic board.
- Keep the tweezers parallel with the logic board surface to prevent damage.

22. Gently slide the end of the fan cable out of the connector.

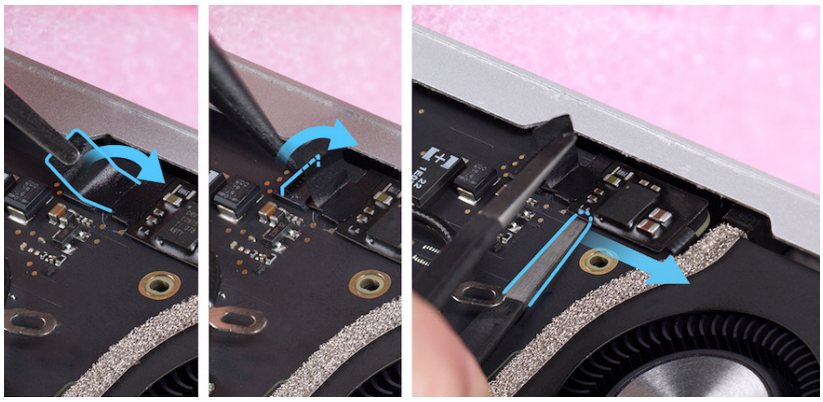
Caution

Don't bend or twist the fan cable.



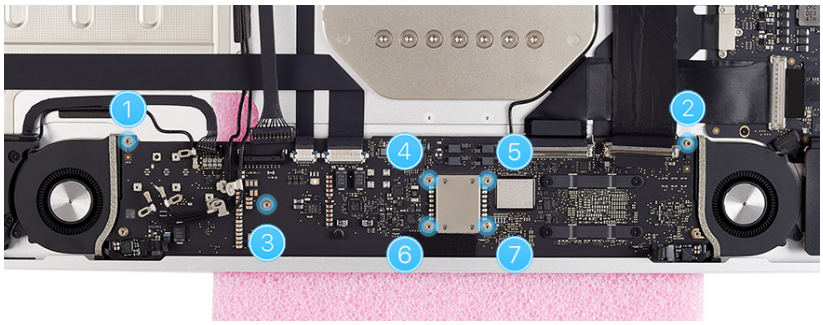
© 2022 Apple Inc. All rights reserved.

23. Repeat steps 19 through 22 to remove the other fan cable.



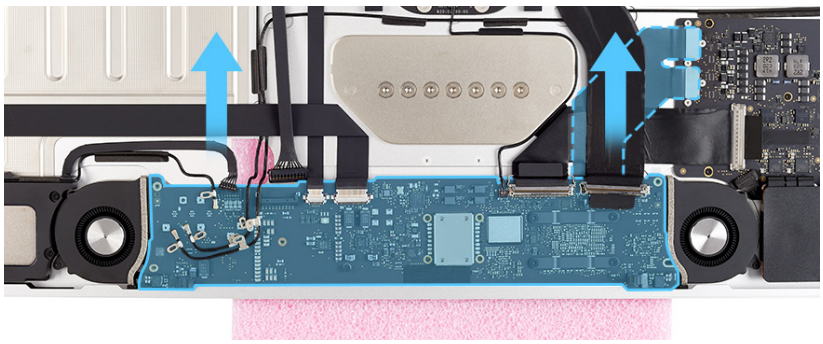
24. Rotate the housing and position it with the logic board closest to you.

25. Use the 2.5 mm hex nut driver to remove the seven 2.5 mm hex nut screws from the logic board.
 - 923-05573 (1–3)
 - 923-05556 (4–7)



26. Move the flex cables out of the way as you tilt up the logic board. Then lift the logic board and low-speed flex cable out of the housing.

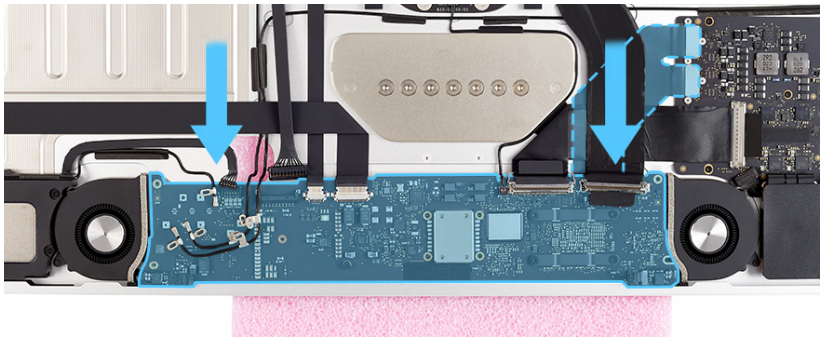
 Note: The low-speed flex cable is attached to the back of the logic board.



© 2022 Apple Inc. All rights reserved.

Reassembly

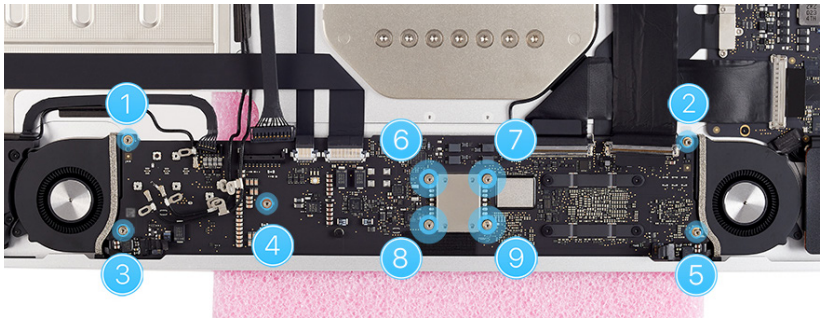
1. Move cables out of the way. Then position the logic board and low-speed flex cable in the housing.



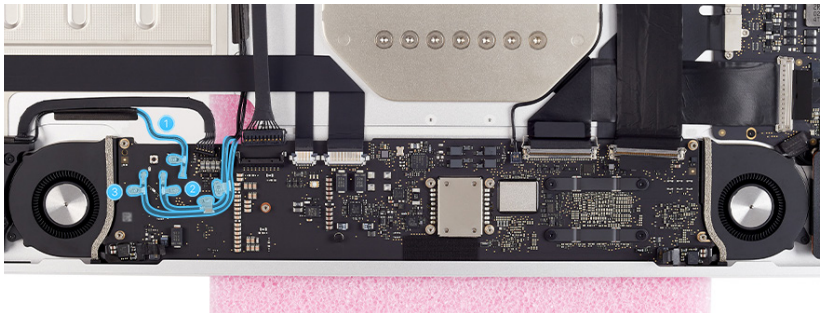
Caution

Don’t trap any loose cables under the logic board.

2. Use the 2.5 mm hex nut driver to reinstall the nine 2.5 mm hex nut screws into the logic board.
 - 923-05573 (1–5)
 - 923-05556 (6–9)



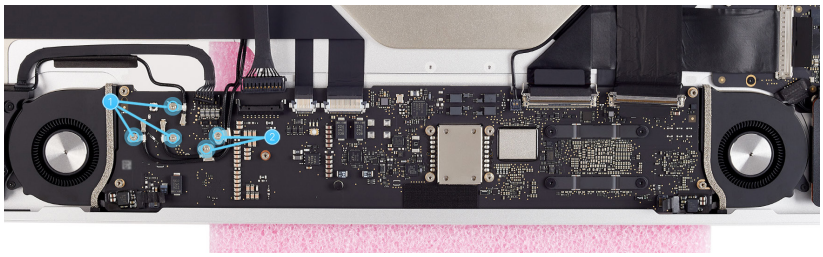
3. Route the shorter antenna coaxial cable (2) under the longer antenna coaxial cable (3). Use the blunt end of the antenna tool to press the ends of the three antenna coaxial cables to the connectors.



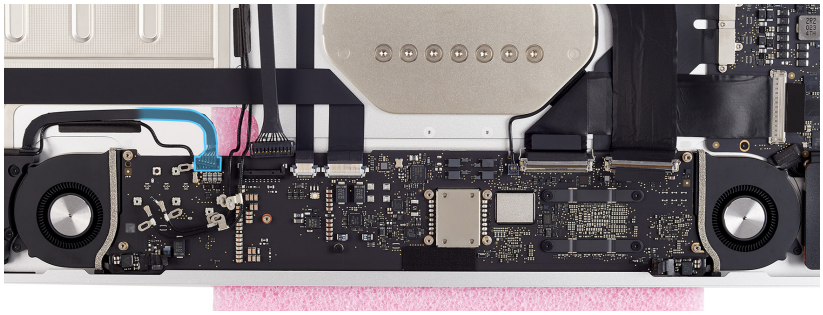
4. Use the blunt end of the antenna tool to press the ends of the three antenna coaxial cables to the connectors.

© 2022 Apple Inc. All rights reserved.

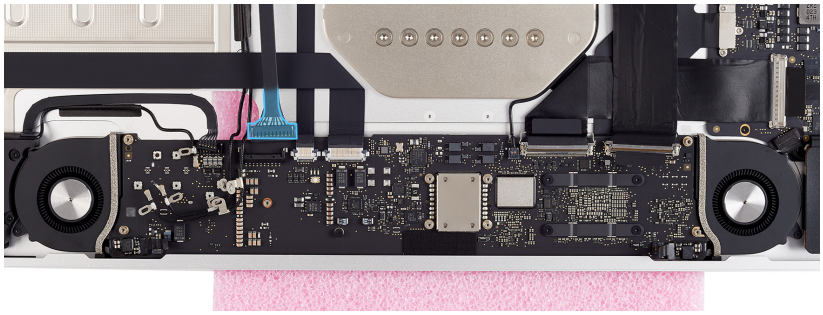
5. Use the T3 screwdriver to reinstall the five T3 screws into the antenna grounding clips.
 - (923-05174) (1)
 - (923-05173) (2)



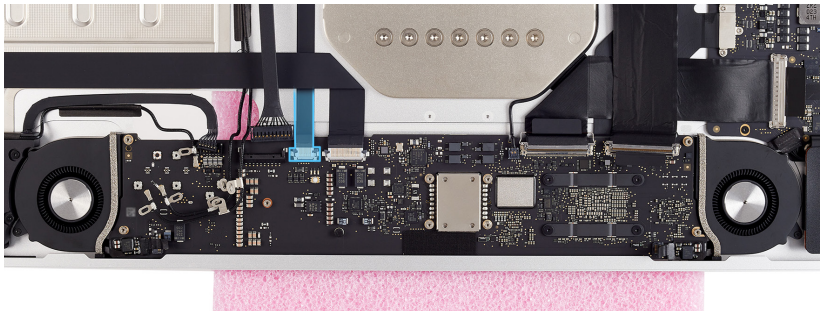
6. Press the end of the speaker cable to the connector. Then reinstall the foam pad over the connector.



7. Slide the end of the display backlight cable into the connector. Then press the polyester film tape back to the display backlight cable connector.

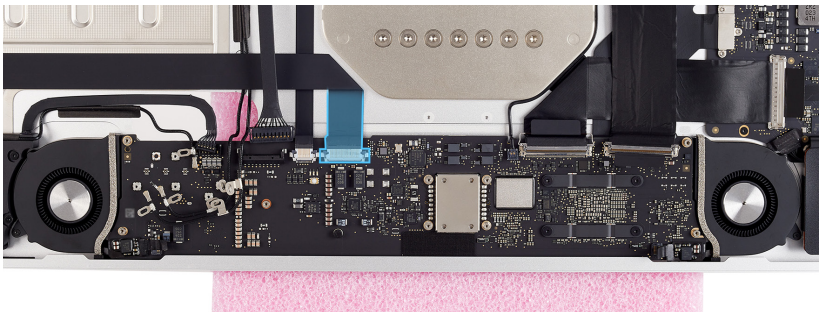


8. Slide the end of the microphone flex cable into the connector.

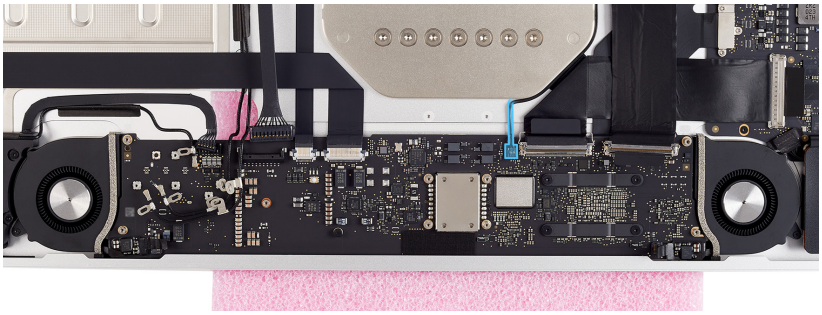


© 2022 Apple Inc. All rights reserved.

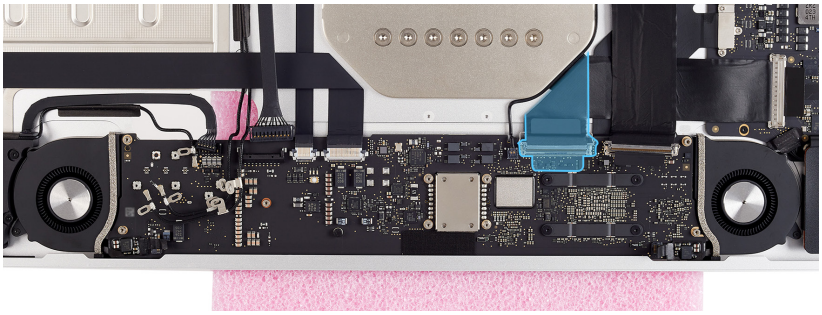
9. Slide the end of the audio board flex cable into the connector.



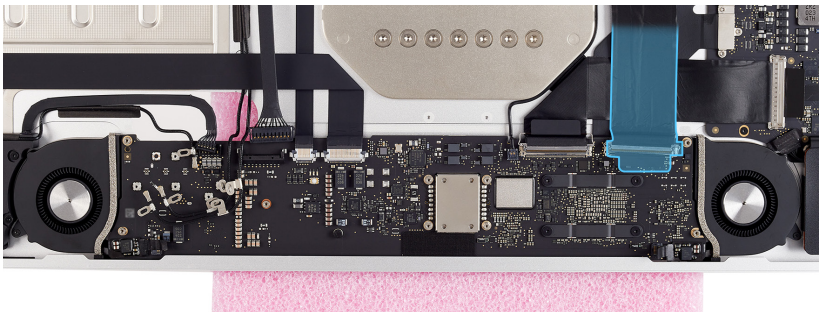
10. Press the end of the battery board cable to the connector.



11. Slide the end of the high-speed flex cable into the connector. Then flip down the locking bar on the high-speed flex cable.



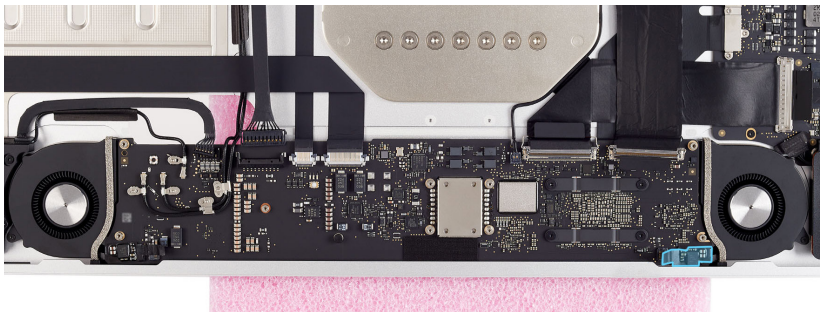
12. Slide the end of the camera and eDP flex cable into the connector. Then flip down the locking bar on the camera and eDP flex cable.



© 2022 Apple Inc. All rights reserved.

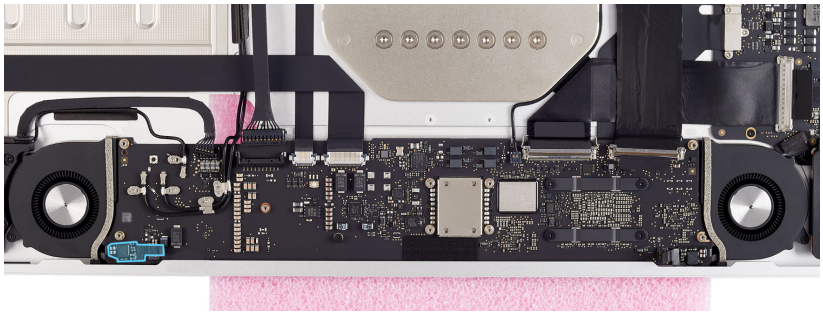
13. Slide the end of the right fan cable into the connector.

14. Press the polyester film tab to the right fan cable connector.



15. Slide the end of the left fan cable into the connector. Then flip down the locking lever on the left fan cable connector.

16. Press the polyester film tab to the left fan cable connector.

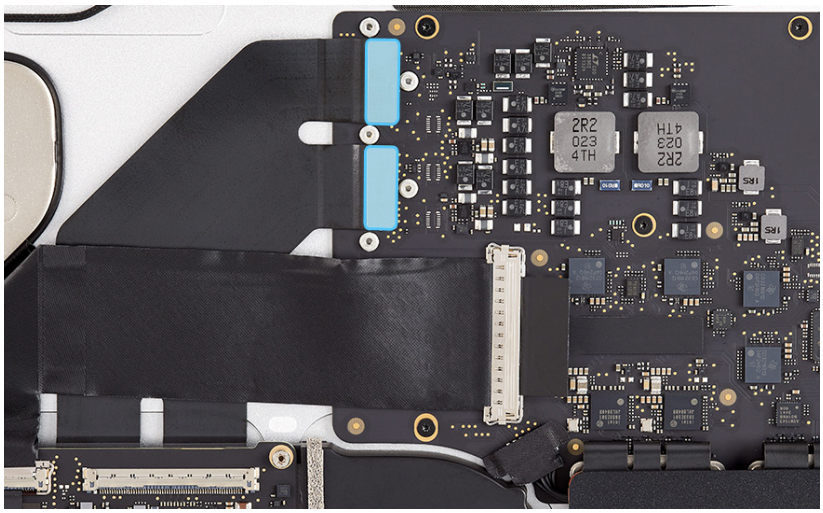


17. Press the ends of the low-speed flex cable to the connectors on the adapter board.

 Note: Ensure that the low-speed flex cable connectors are fully connected.

Caution

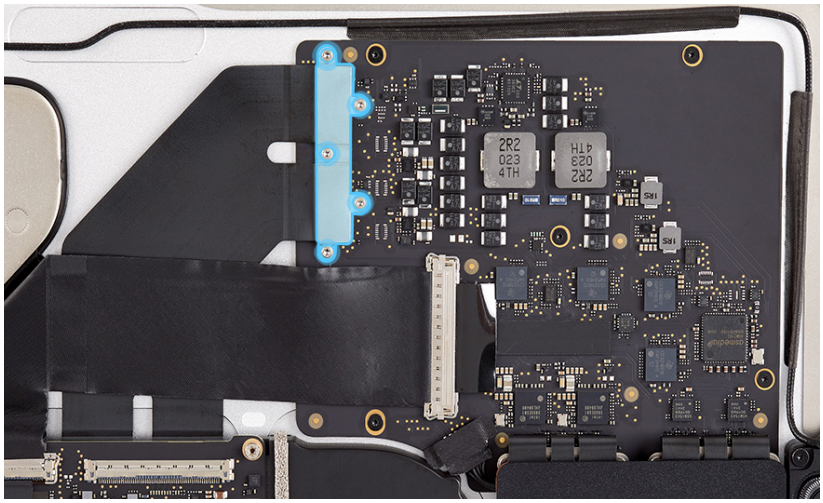
Don't bend the connectors.



© 2022 Apple Inc. All rights reserved.

18. Position the low-speed flex cable cowling over the connectors.

19. Use the T3 screwdriver to reinstall the five T3 screws (923-05559) into the low-speed flex cable cowling.



Reinstall the following parts to complete reassembly:

- Logic board cover
- Display

Caution

After you've completed all removal and reassembly steps, learn how to initiate the System Configuration process at support.apple.com/self-service-repair.

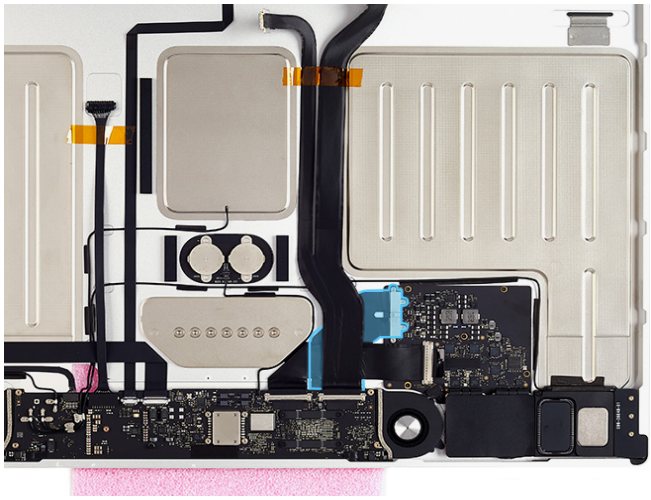
© 2022 Apple Inc. All rights reserved.

Low-Speed Flex Cable

Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover
- Logic board



Tools

- Nylon probe (black stick)
- Support wedges
- Torx T3 screwdriver

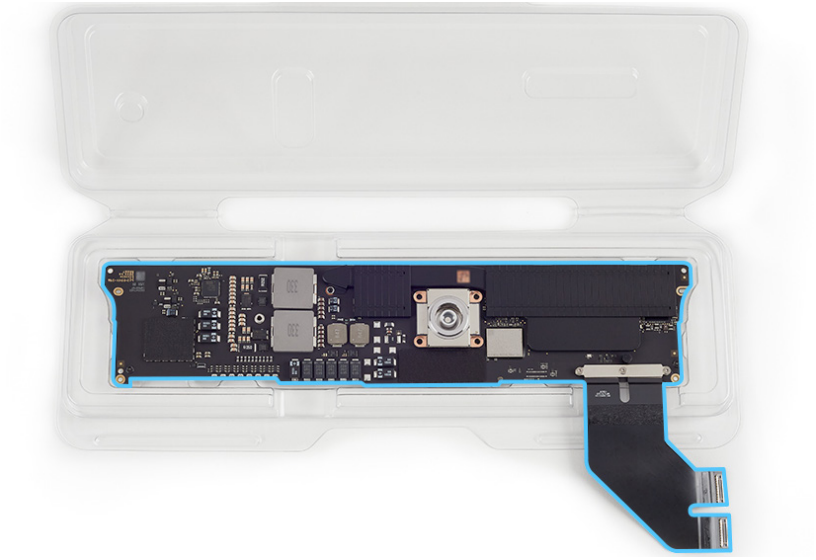
© 2022 Apple Inc. All rights reserved.

Removal

Caution

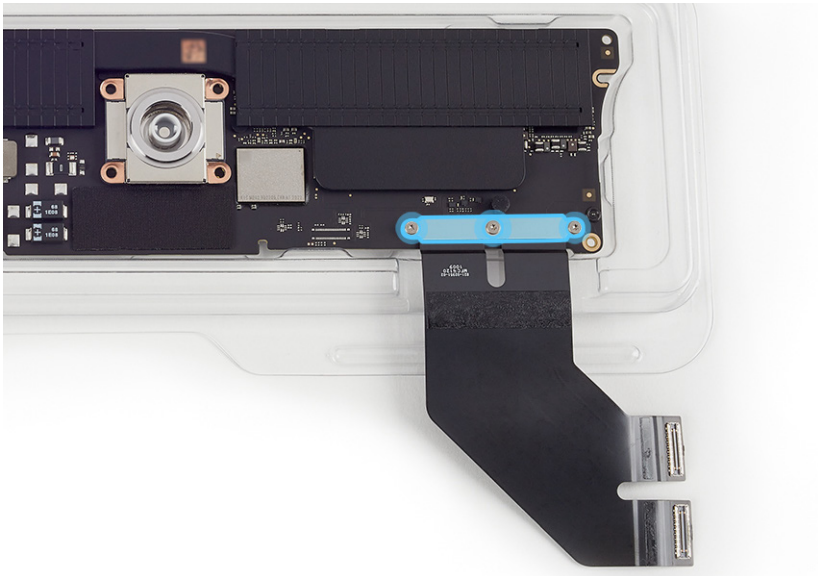
If the logic board service part packaging isn't available, perform the following steps on an ESD-safe surface. Don't bend the logic board when removing or reinstalling the low-speed flex cable.

1. Ensure that the logic board is positioned in the logic board service part packaging tray as shown.



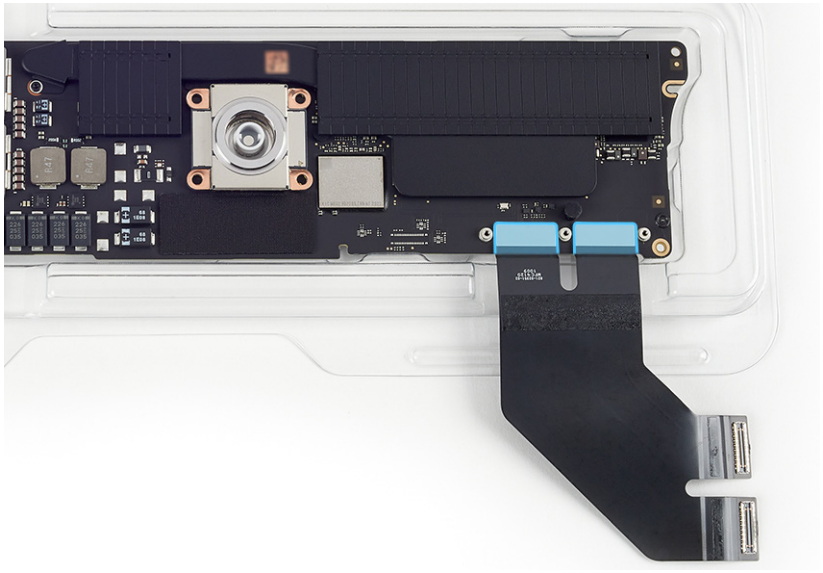
2. Use the T3 screwdriver to remove the three T3 screws (923-05561) from the low-speed flex cable to logic board connector cowling.

3. Remove the low-speed flex cable to logic board connector cowling. Save it for reassembly.



© 2022 Apple Inc. All rights reserved.

4. Use the flat end of the black stick to lift both ends of the low-speed flex cable off the connectors on the logic board.

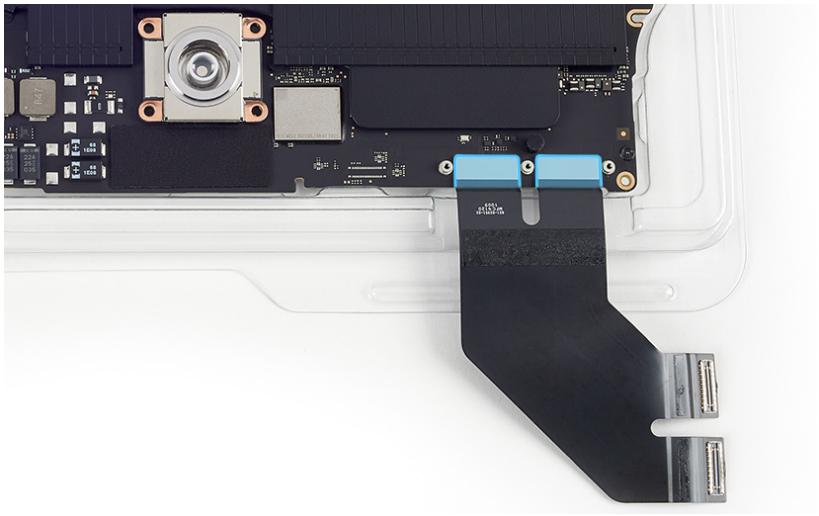


© 2022 Apple Inc. All rights reserved.

Reassembly

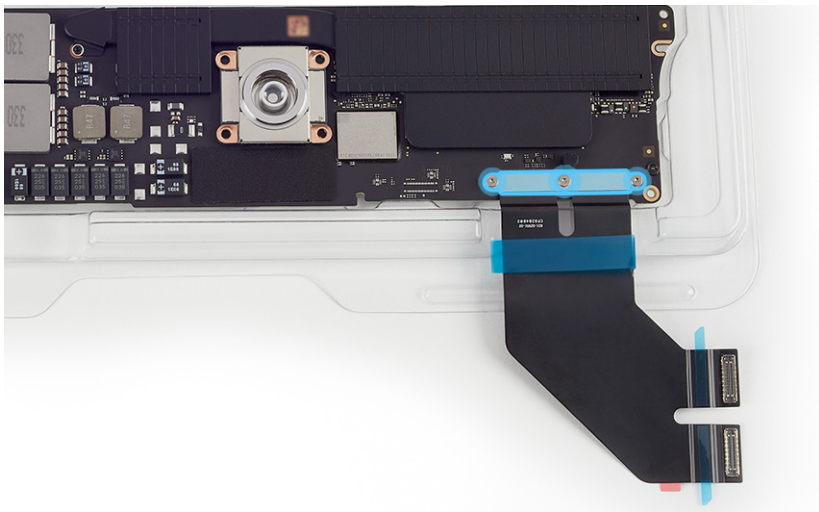
1. Gently press the ends of the low-speed flex cable to the connectors on the logic board.

 Note: Don't bend the connectors.



2. Reinstall the low-speed flex cable cowling.

3. Use the T3 screwdriver to reinstall the three T3 screws (923-05561) into the low-speed flex cable cowling.



Important

If you install a replacement low-speed flex cable, leave the adhesive release liners in place until you reinstall the logic board and low-speed flex cable.

Reinstall the following parts to complete reassembly:

- Logic board
- Logic board cover
- Display

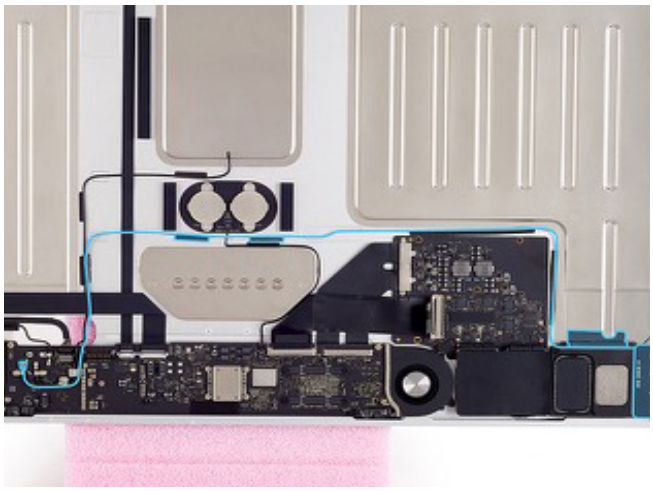
© 2022 Apple Inc. All rights reserved.

Wi-Fi Antenna

Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover



Tools

- Antenna tool
- Nylon probe (black stick)
- Support wedges
- Torx T3 screwdriver

© 2022 Apple Inc. All rights reserved.

Removal

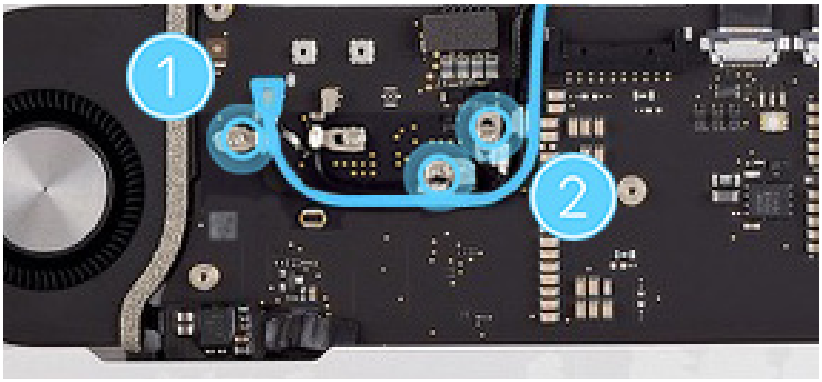
1. Use the T3 screwdriver to remove the three T3 screws (923-05574) from the Wi-Fi antenna.



2. Use the T3 screwdriver to remove the three T3 screws from the antenna grounding clips on the logic board.

 Note: The T3 screw (923-05174) (1) closest to the connector is shorter than the other two T3 screws.

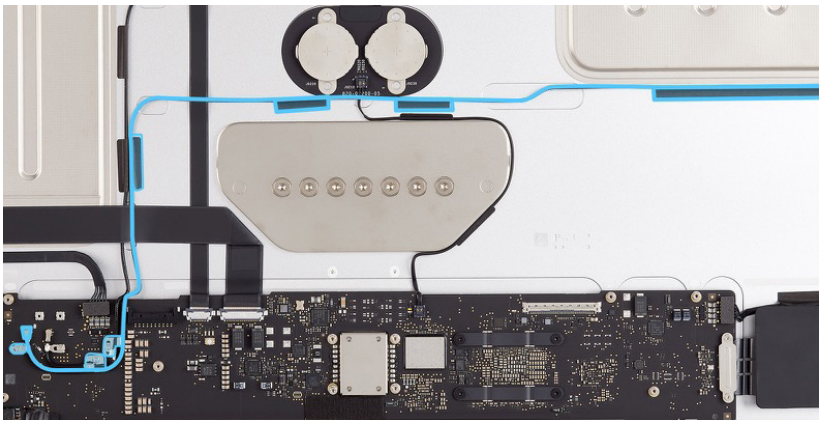
 - (923-05174) (1)
 - (923-05173) (2)



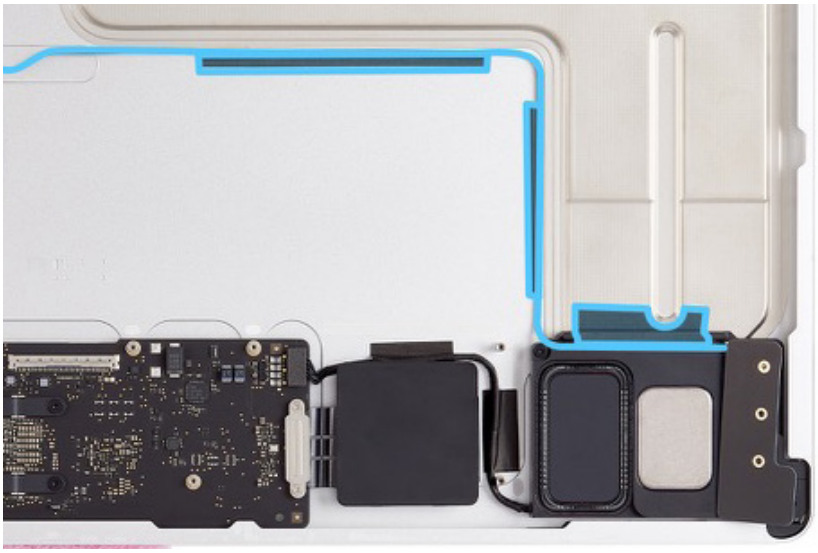
3. Use the antenna tool to lift the end of the Wi-Fi antenna cable from the connector on the logic board.

© 2022 Apple Inc. All rights reserved.

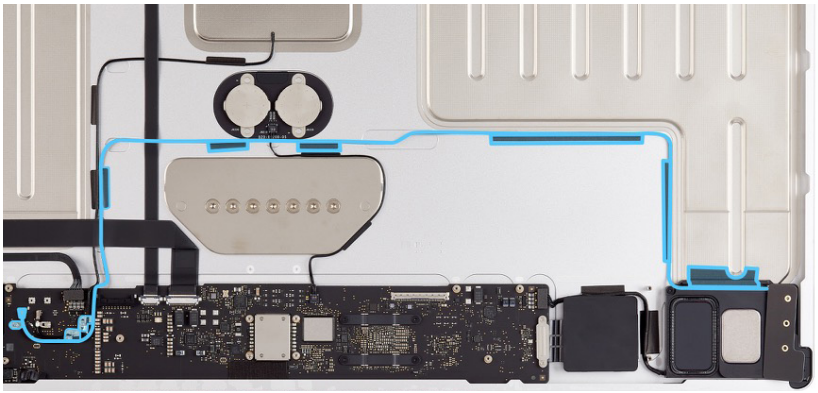
4. Use the black stick to peel the antenna cable tape from the housing.



5. Carefully lift the cable out of the channel in the speaker.



6. Remove the Wi-Fi antenna from the housing.



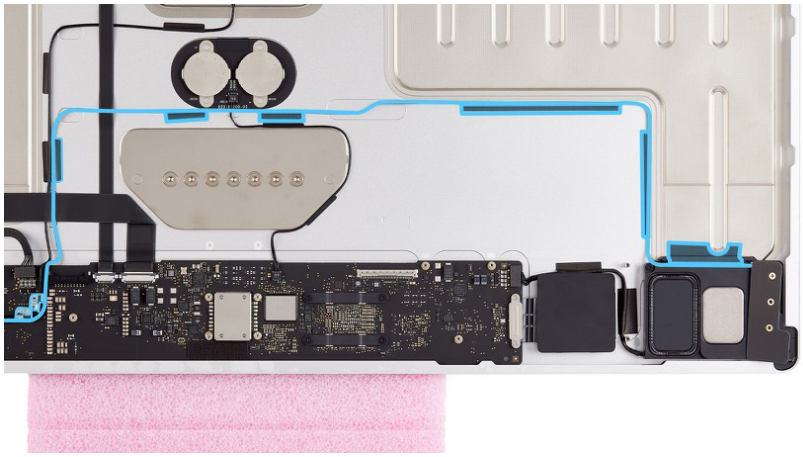
© 2022 Apple Inc. All rights reserved.

Reassembly

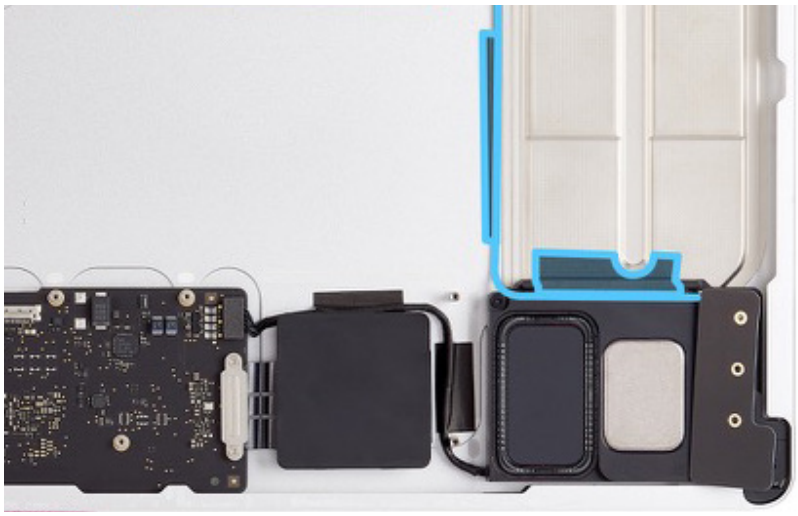
1. Route the Wi-Fi antenna cable as shown. Then press along the length of the antenna cable tape to adhere it to the housing.

Important

Ensure that the antenna cable tape covers the etched areas on the housing as shown.



2. Route the antenna cable around the adapter board.



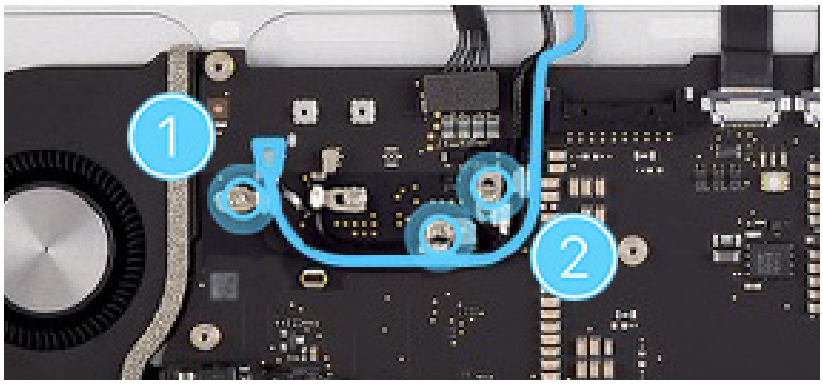
3. Use the flat end of the antenna tool to press the end of the Wi-Fi antenna cable to the connector on the logic board.

© 2022 Apple Inc. All rights reserved.

4. Use the T3 screwdriver to reinstall the three T3 screws into the antenna grounding clips on the logic board.

 Note: The T3 screw (923-05174) (1) closest to the connector is shorter than the other two T3 screws.

 - (923-05174) (1)
 - (923-05173) (2)



5. Use the T3 screwdriver to reinstall the three T3 screws into the Wi-Fi antenna.



Reinstall the following parts to complete reassembly:

- Logic board cover
- Display

© 2022 Apple Inc. All rights reserved.

Wi-Fi and Bluetooth Antenna

Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover



Tools

- Antenna tool
- Nylon probe (black stick)
- Support wedges
- Torx T3 screwdriver

© 2022 Apple Inc. All rights reserved.

Removal

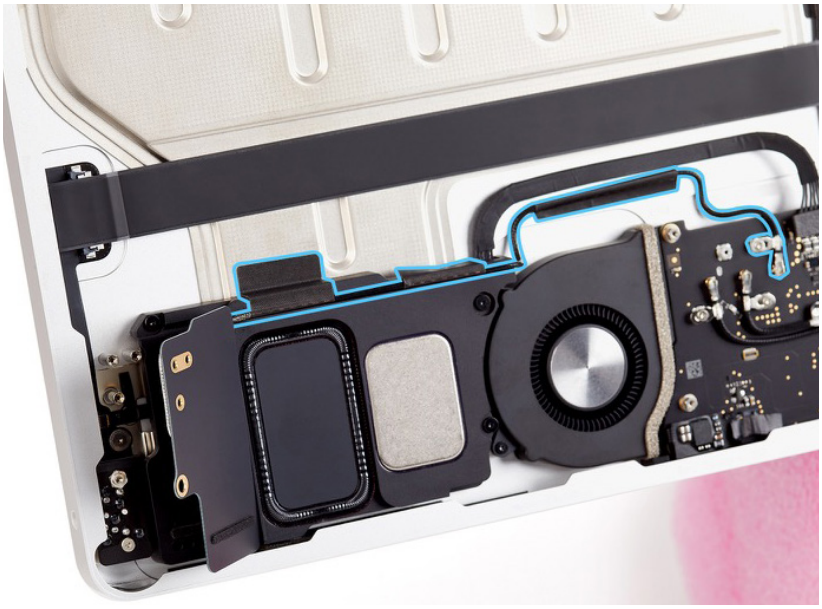
1. Use the T3 screwdriver to remove the four T3 screws from the Wi-Fi and Bluetooth antenna.

 Note: The bottom screw has a larger head than the top three screws.



2. Use the T3 screwdriver to remove the T3 screw (923-05174) from the antenna grounding clip on the logic board.

3. Use the antenna tool to lift the end of the Wi-Fi and Bluetooth antenna from the logic board.



© 2022 Apple Inc. All rights reserved.

4. Use the black stick to peel the Wi-Fi and Bluetooth antenna cable tape from the speaker and housing.

5. Carefully lift the cable out of the channel in the speaker.



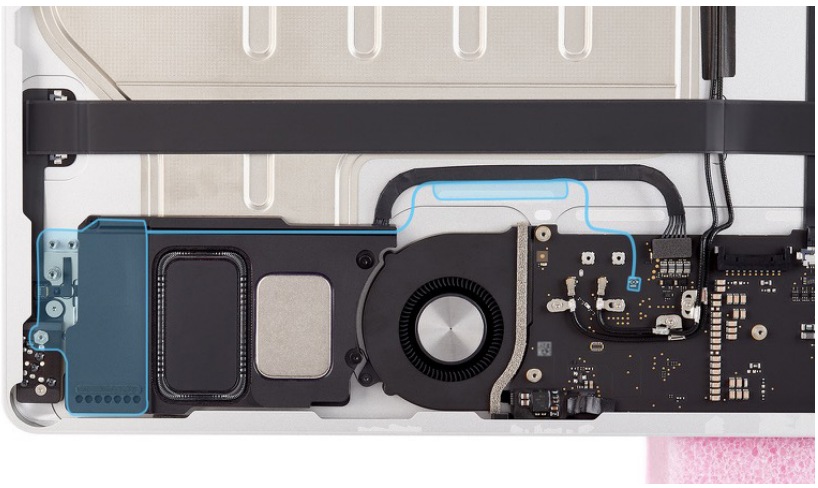
© 2022 Apple Inc. All rights reserved.

Reassembly

1. Position the Wi-Fi and Bluetooth antenna in the bottom left of the housing as shown.

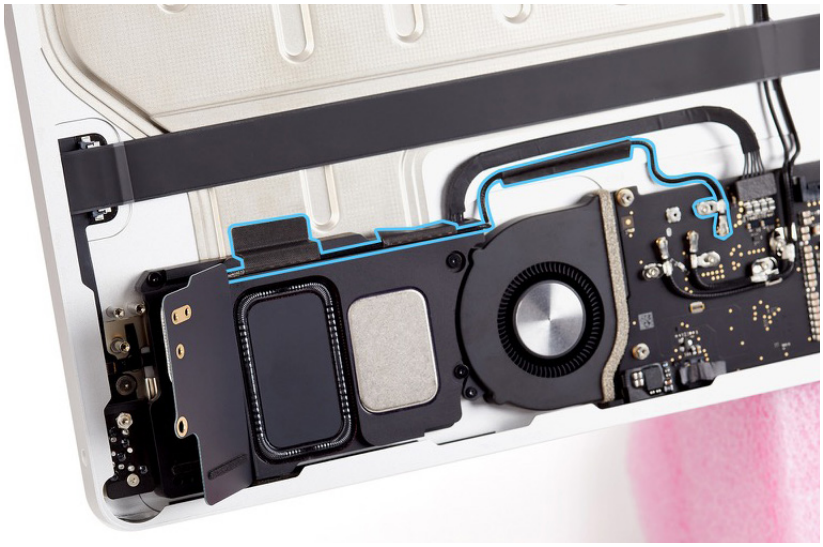
> **Important**
>
> Ensure that the antenna cable tape covers the etched areas on the housing as shown.

2. Route the Wi-Fi and Bluetooth antenna cable through the channel in the speaker.



3. Use the flat end of the antenna tool to press the end of the Wi-Fi and Bluetooth antenna to the logic board.

4. Use the T3 screwdriver to reinstall the T3 screw (923-05174) into the antenna grounding clip.



© 2022 Apple Inc. All rights reserved.

5. Press the antenna cable tape back onto the speaker and housing.

Important

If installing a replacement Wi-Fi and Bluetooth antenna, peel off the adhesive release liners from the tape before adhering it to the speaker and housing.

6. Use the T3 screwdriver to reinstall the four T3 screws into the Wi-Fi and Bluetooth antenna.



Reinstall the following parts to complete reassembly:

- Logic board cover
- Display

© 2022 Apple Inc. All rights reserved.

Housing

Before You Begin

Remove the following parts before you begin:

- Display
- Logic board cover
- Battery board and Batteries
- Battery board cable
- Camera and embedded DisplayPort flex cable
- Display backlight cable
- Adapter board
- USB-C boards
- High-speed flex cable
- Logic board
- Fans
- Stand or VESA mount adapter



Tools

- No tools are required.

© 2022 Apple Inc. All rights reserved.

Removal

There are no additional removal steps. The housing includes the following removable parts:

- Audio board
- Audio board and power button cable
- Microphone flex cable
- Wi-Fi and Bluetooth antenna
- Wi-Fi antenna

The housing also includes the following nonremovable parts:

- Center Wi-Fi antenna
- Display hangers
- Microphone
- Power button and power button flex cable
- Speakers
- Speaker back volumes

© 2022 Apple Inc. All rights reserved.

Reassembly

Reinstall the following parts to complete reassembly:

- Stand or VESA mount adapter
- Fans
- Logic board
- High-speed flex cable
- Adapter board
- USB-C boards
- Display backlight cable
- Camera and embedded DisplayPort flex cable
- Battery board cable
- Battery board and Batteries
- Logic board cover
- Display

Torx® is a registered trademark of Acument Intellectual Properties, LLC.

© 2022 Apple Inc. All rights reserved.